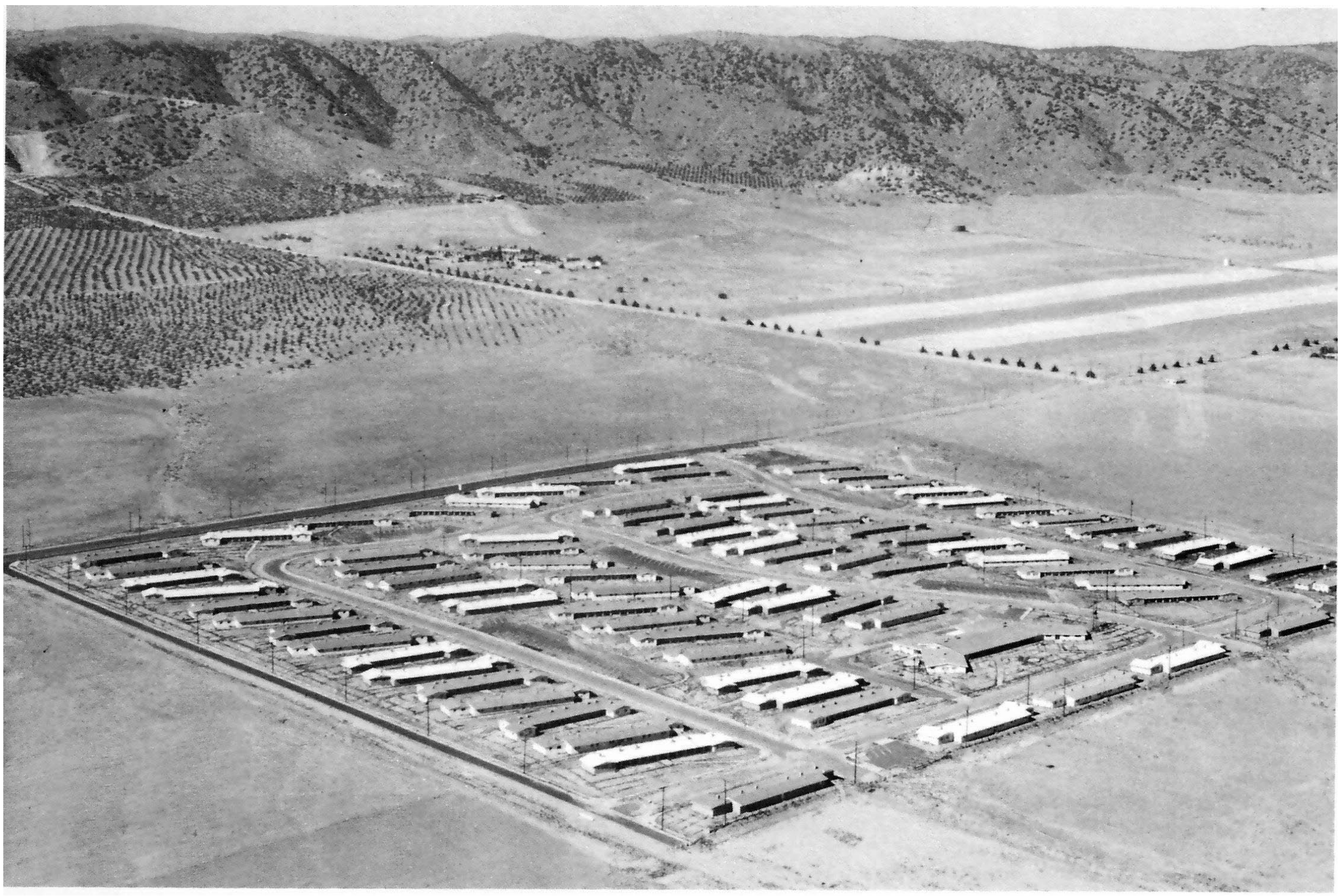
SOIL SURVEY

ANTELOPE VALLEY AREA
California



UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service

In cooperation with

UNIVERSITY OF CALIFORNIA

Agricultural Experiment Station

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Major fieldwork for this soil survey was done in the period 1960 to 1967. Unless otherwise indicated, statements in the publication refer to conditions in the Antelope Valley Area in 1967. This survey was made cooperatively by the Soil Conservation Service, Los Angeles County, the Antelope Valley Soil Conservation District, and the University of California Agricultural Experiment Station as part of the assistance furnished to the Antelope Valley and Upper Santa Clara Soil Conservation Districts.

Preparation of this soil survey was partly financed by Los Angeles County and by the Antelope Valley Soil Conservation District under provisions of an agreement with the Soil Conservation Service, U.S. Department of Agriculture.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or can be purchased, on individual order, from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C., 20250.

HOW TO USE THIS SOIL SURVEY

THIS SURVEY of the Antelope Valley Area contains information that can be applied in managing farms and ranches; in selecting sites for roads, ponds, buildings or other structures; and in judging the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

All of the soils of the Antelope Valley Area are shown on the detailed map at the back of this survey. This map consists of many sheets that are made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbol. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in the survey. This guide lists all the soils of the county in alphabetical order by map symbol. It shows the page where each soil is described and the page for the capability unit in which the soil has been placed. It also lists the range site, windbreak group, vegetative soil group, and wildlife group for each soil.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and information in the text. Interpretations not included in the text can be developed by grouping the soils according to their limitations for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils in the soil descriptions and in the section that discusses management of the soils for crops and pasture.

Ranchers and others interested in range can find under "Use of the Soils for Range" information about the suitability of the soils for range and also the plants that grow on each range site.

Foresters and others can refer to the section "Use of the Soils for Windbreaks," where the soils of the survey area are grouped according to their suitability for trees and windbreaks.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife under "Use of the Soils for Wildlife."

Engineers and builders will find under "Engineering Uses of the Soils" tables that give engineering descriptions of the soils in the survey area and that name soil features that affect engineering practices and structures.

Community planners and others concerned with community development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the section "Use of the Soils for Recreation and Related Purposes."

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation, Morphology, and Classification of the Soils."

Newcomers in the Antelope Valley Area may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Additional Facts About the Area," which gives additional information about the survey area.

Cover Picture

Community for senior citizens and almond orchard on Greenfield sandy loam, and alternate strips of fallow and wheat on Hanford coarse sandy loam.

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SOIL SURVEY OF THE ANTELOPE VALLEY AREA, CALIFORNIA

FIELDWORK BY GEORGE A. WOODRUFF, WILLIAM J. McCOY, AND WAYNE B. SHELDON, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH UNIVERSITY OF CALIFORNIA AGRICULTURAL EXPERIMENT STATION

THE ANTELOPE VALLEY AREA includes nearly all of the northern part of Los Angeles County; about 186,500 acres of Kern County, west of Rosamond; and about 7,200 acres of Ventura County, west of Gorman (fig. 1). The Area is roughly rectangular and is

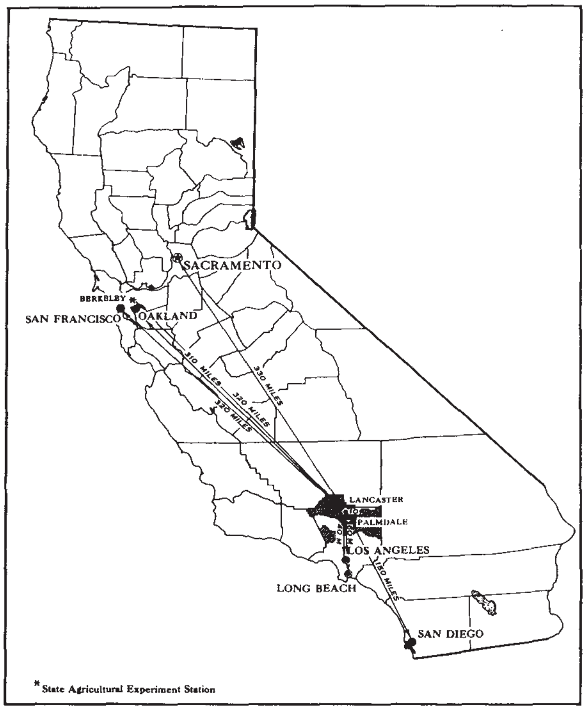

Figure 1.--Location of the Antelope Valley Area in California.

about 70 miles from east to west and 30 miles from north to south. The total extent is about 1,634 square miles, or 1,045,575 acres.

To the east, the Area merges into the central part of the Mojave Desert and is bordered by San Bernadino County. Ventura County forms most of the western boundary; the southern flank of the Tehachapi Mountains, the northwestern boundary; and the Edwards Air Force Base, the northeastern boundary. That part of the Base that extends into Los Angeles County is excluded. Also excluded is the Angeles National Forest. The topography includes rugged mountains, foothills, broad smooth valleys, and desert areas. Elevations range from about 1,000 feet, in the southwestern valleys, to more than 6,000 feet, on mountain peaks to the north.

In 1967, according to estimates made by the Lancaster Chamber of Commerce, the Area had a population of about 110,000. The major communities are Lancaster and Palmdale, and their population was estimated to be 40,000 and 18,000, respectively. Newhall, in the southwestern part of the Area, had an estimated population of about 15,000, and Littlerock, in the southeastern part, a population of about 3,500.

The soils in the Area are nearly level to very steep. They are suitable for many kinds of crops, but the better drained soils on alluvial fans and terraces throughout the Area are best suited. Much of the acreage is used for irrigated crops. Dryland farming and the raising of livestock are important, however, in the middle and western parts of the Area along alluvial fans, terraces, and foothills. Poultry raising also is important in some areas. The lower part of the foothills is used as range by beef cattle. Drier parts of the desert floor and foothills are used for grazing in spring, mainly by sheep. Some cattle also graze these areas in winter and fall in conjunction with aftermath grazing of alfalfa and grain stubble.

Livestock grazing was the major agricultural enterprise in the Area until about 1890. At about this time, dryland farming was introduced and irrigation farming also was started. Alfalfa is the principal irrigated crop, and most of it is shipped as hay to the dairy industry in Los Angeles. Sugar beets, almonds, peaches, pears, potatoes, and small grains are the chief other irrigated crops, but some truck crops are grown. Barley and wheat are the chief dryland small grains. The success of dryland crops depends upon rainfall in winter, which varies from year to year.

The major industry in the Area is centered around the many aerospace firms connected with the defense effort. A large cement plant near Gorman also employs many workers.

Throughout the Area, State highways and secondary roads connect smaller communities, and new freeways help to speed traffic to major centers. Buses, trucklines, airlines, and a railroad provide shipping facilities and transportation.

Electric power, gas and oil, telephone service, hospitals, and other modern conveniences are available throughout the Area. Schools, churches, and social and business groups also are well distributed. The Area also provides many opportunities for hiking, hunting, fishing, and other recreation. In addition, the picturesque high desert terrain in the northeastern part of the Area serves as the locale of many television and movie productions.

HOW THIS SURVEY WAS MADE

Soil scientists made this survey to learn what kinds of soils are in the Antelope Valley Area, where they are located, and how they can be used.

They went into the Area knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the Area, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in areas nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. For successful use of this survey, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Hesperia and Rosamond, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that go with their behavior in the natural landscape. Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Adelanto loamy sand and Adelanto gravelly sandy loam are two soil types in the same series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Greenfield sandy loam, 0 to 2 percent slopes, is one of several phases of Greenfield sandy loam, a soil that ranges from nearly level to strongly sloping.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show roads, buildings, field borders, trees, and other details that greatly help in drawing soil boundaries accurately. The soil map at the back of this survey was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intermingled, and so small in size that it is not practical to show them separately on the map. Therefore, they show the soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it, for example, Pond-Oban complex. The soil scientists may show as one mapping unit two or more soils that have differences not significant enough to make it practical to show them separately on the map. Such a mapping unit is called an undifferentiated soil group. An example is Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded. Also, most surveys include areas where the soil material is so rocky, so shallow, or so frequently worked by wind and water that it cannot be classified by soil series. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Riverwash or Rock land, and are called land types.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils that are suitable for cultivation.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in a way that is readily useful to different groups of readers, among them farmers, ranchers, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey. On the basis of the yield and practice tables and other data, the soil scientists set up trial groups and then test them by further study and by consultation with farmers, agronomists, engineers, and others. Then, the scientists adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

The general soil map at the back of this survey shows, in color, the soil associations in the Antelope Valley Area. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in an area, who want to compare different parts of an area, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

The sixteen soil associations in the Antelope Valley Area are grouped, on the basis of physiography, as follows: (1) Six of the associations in the Mojave Desert region; (2) two on alluvial fans and terraces; and (3) eight on uplands.

Soils of the Mojave Desert

The Mojave Desert region is in the northeastern part of the survey area in a generally northern direction from Palmdale, Littlerock, and Pearblossom. This region is the extreme southwestern extension of the Mojave Desert into Los Angeles County. It includes parts of Kern County, the city of Lancaster, and the eastern part of Antelope Valley and extends westward from San Bernardino County to about 110th Street West.

Most of the desert region is a high basin that includes remnants of old regions that occur as scattered buttes in the eastern part. Near High Vista are low granitic uplands. In the lowest part of the Antelope Valley, near the border between Los Angeles and Kern Counties, are Rosamond Lake and Rodgers Lake. These are dry lakes that receive water only from intermittent streams.

Summers in the desert are hot and dry. Winters are fairly cold. Elevations range from 2,310 to 3,110 feet. Precipitation ranges from 4 to 9 inches annually, and irrigation is necessary for cultivated crops. Strong prevailing winds blow from the west and are strongest in spring. The vegetation is mainly annual forbs and grasses and scattered desert shrubs, such as creosotebush, Mormon tea, Joshua-tree, saltbush, and rabbitbrush, but big sagebrush grows in some places.

Six of the soil associations in the Antelope Valley Area are in the desert region. They make up 45 percent of the survey area.

1. Calvista-Hi Vista Association

Gently sloping to moderately steep, well-drained soils that have a sandy loam or loamy fine sand surface layer; shallow to moderately deep over granite; on low hills

This soil association is in the northeastern corner of the survey area on low hills near Hi Vista. The soils are well drained and formed in material weathered from granitic rock. Slopes range from 2 to 30 percent. Elevations range from 2,900 to 3,100 feet, and the average annual rainfall from 4 to 6 inches. The average annual temperature is 63° F., and the frost-free season ranges from 210 to 240 days. The vegetation is mainly annual grasses and forbs but includes scattered Joshua trees, patches of creosotebush, and remnant stands of Indian ricegrass. This association occupies about 4 percent of the survey area.

Calvista soils make up about 60 percent of this association, and Hi Vista soils about 35 percent. The remaining 5 percent consists of Rock land.

Calvista soils are shallow over hard granite and are moderately alkaline and calcareous throughout. They have a surface layer of pale-brown sandy loam. Just below is light yellowish-brown heavy sandy loam. Depth to granite ranges from 16 to 18 inches.

Hi Vista soils are moderately deep over hard granite. Their surface layer is light yellowish-brown, neutral loamy fine sand. The subsoil is brown, reddish-brown, and yellowish-red, mildly alkaline and moderately alkaline, calcareous light clay loam, sandy clay loam, and gravelly light sandy clay loam. Depth to granite is 25 to 36 inches.

This association is used for occasional grazing in spring and for recreation. Some areas have been subdivided into small tracts for use as homesites.

2. Hesperia-Rosamond-Cajon Association

Nearly level to strongly sloping, moderately well drained to excessively drained, very deep soils that have a loamy sand to silty clay loam surface layer; on recent alluvial fans

This soil association is east of Lancaster and north and west of Palmdale on recent alluvial fans. The soils are very deep and are moderately well drained to excessively drained. They formed in alluvium derived from granitic rock. Slopes range from 0 to 15 percent. Elevations range from 2,400 to 2,900 feet. The average annual rainfall is 4 to 9 inches, the average annual temperature is 62° F., and the frost-free season ranges from 240 to 260 days. The vegetation is mainly annual grasses and forbs and clumps of Joshua-trees, Mormon tea, and rabbitbrush, but big sagebrush grows in some places. This association makes up about 30 percent of the survey area.

Hesperia soils make up about 40 percent of the association; Rosamond soils, about 30 percent; and Cajon soils, about 25 percent. The remaining 5 percent consists of Arizo soils and of Riverwash.

Hesperia soils are well drained. The surface layer is pale-brown, slightly acid loamy fine sand to loam. It overlies pale-brown, mildly alkaline and moderately alkaline fine sandy loam and sandy loam that is calcareous in the lower part.

Rosamond soils are moderately well drained. They are light brownish-gray and pale-brown, mildly

alkaline and moderately alkaline, stratified loamy fine sands to silty clay loams that are calcareous in the lower part.

Cajon soils are excessively drained and are very pale brown throughout. The surface layer is neutral loamy sand and loamy fine sand. Below is mildly alkaline fine sand underlain by moderately alkaline sand that is calcareous in the lower part.

This association is used mainly for irrigated alfalfa, small grain, pasture, orchards, and sugar beets, but other row crops are grown in some places. The areas are also used for range in spring.

3. Pond-Tray-Oban Association

Nearly level, moderately well drained, very deep soils that have a fine sand to silty clay loam surface layer; in basins

This soil association is in basins north of Lancaster and south of Rosamond. It extends northeastward as far as Rosamond Lake, which is a dry lake. These soils are very deep, are moderately well drained, and in places contain slight to moderate amounts of soluble salts or alkali. They formed in alluvium derived from granitic rock. Slopes are 0 to 2 percent. Elevations range from 2,310 to 2,400 feet. The average annual rainfall is 4 to 9 inches, the average annual temperature is 62° F., and the frost-free season ranges from 240 to 260 days. Grasses, forbs, saltbush, alkali sacaton, alkali blite, and saltgrass make up the vegetation. This association occupies about 5 percent of the survey area.

Pond soils make up about 55 percent of this association; Tray soils, about 30 percent; and the remaining 15 percent consists of Oban soils.

Pond soils have a surface layer of light brownish-gray, calcareous loam or silty clay loam. Their subsoil, also light brownish-gray, is calcareous clay loam. The substratum is light-gray to white, calcareous, stratified silt loam and light clay loam.

Tray soils have a surface layer of light yellowish-brown, calcareous sandy loam, fine sand, or loam. The subsoil is yellowish-brown, calcareous sandy loam to loam. Below is light yellowish-brown coarse sandy loam.

Oban soils have a surface layer of light yellowish-brown, moderately alkaline fine sandy loam. Their subsoil is pale-brown, yellowish-brown, and light olive-brown, calcareous heavy clay loam and heavy loam. Below is light olive-brown and very pale brown, calcareous gravelly coarse sandy loam.

The soils of this association are used chiefly for limited grazing in spring, though some areas are used for irrigated crops. Other areas are used for industrial purposes or for duck ponds or other recreation.

4. Sunrise Association

Nearly level, moderately well drained soils that have a loamy fine sand to loam surface layer; shallow to moderately deep over caliche; on the basin rim

The soils in this association are near Lancaster and west of Rosamond on the basin rim. They are moderately well drained and are shallow to moderately deep over caliche. In some places the soils are moderately saline-alkali. These soils formed in alluvium derived from granitic rock. Slopes range from 0 to 2 percent. Elevations range from 2,400 to 2,450 feet. The average annual rainfall is 4 to 9 inches, the average annual temperature is 62° F., and the frost-free season is 240 to 250 days. Annual grasses, forbs, sagebrush, saltbush, and rabbitbrush make up the vegetation. This association occupies about 1 percent of the survey area.

Sunrise soils make up about 85 percent of this association; Merrill soils, about 5 percent; and Cajon, Hesperia, and Rosamond soils, the remaining 10 percent.

Sunrise soils are shallow to moderately deep. Their surface layer is very pale brown and light yellowish-brown, calcareous loamy fine sand to loam. Below is pale-yellow, calcareous heavy loam and white, calcareous, weakly to strongly cemented caliche. Depth to the caliche ranges from 10 to 39 inches.

The soils of this association are used for alfalfa and for limited grazing in spring. Some areas are used for homes, schools, and related purposes, and others are used for recreation.

5. Adelanto Association

Nearly level to gently sloping, well-drained, very deep soils that have a loamy sand or gravelly sandy loam surface layer; on alluvial fans and terraces

The soils in this association are near Palmdale or are west of Willow Springs on alluvial fans and terraces. These soils are very deep and are well drained. They formed in alluvium derived from granitic rock. Slopes range from 0 to 5 percent. Elevations range from 2,450 to 2,800 feet. The average annual rainfall is 4 to 9 inches, the average annual temperature is 62° F., and the frost-free season ranges from 240 to 260 days. The vegetation is chiefly annual grasses and forbs, but desert stipa grows in scattered areas, and sagebrush, creosotebushes, Joshua-trees, and junipers grow in some areas. This association occupies about 3 percent of the survey area.

Adelanto soils make up 90 percent of this association; Mohave soils, about 5 percent; and Cajon and Hesperia soils, the remaining 5 percent.

Adelanto soils have a surface layer of brown and light-brown, slightly acid and neutral loamy sand to gravelly sandy loam. Below is light-brown to reddish-brown, calcareous sandy loam and heavy sandy loam. In some areas the profile is gravelly throughout.

The soils of this association are used for irrigated crops adapted to the climate. They also are

used for limited grazing in spring, as wildlife habitat, and for residential, commercial, and industrial purposes.

6. Arizo Association

Nearly level to gently sloping, excessively drained, very deep soils that have a loamy fine sand or gravelly loamy sand surface layer; on alluvial fans

This soil association is along Big Rock Creek and Little Rock Creek on alluvial fans. The soils are very deep and are excessively drained. They formed in very gravelly, granitic alluvium. Slopes range from 0 to 5 percent. Elevations range from 2,950 to 3,100 feet. Average annual rainfall is 4 to 9 inches, average annual temperature is 62° F., and the frost-free period is 240 to 260 days. Annual grasses, forbs, creosotebush, Mormon tea, and rabbitbrush make up the vegetation. The association occupies about 2 percent of the survey area.

Arizo soils make up about 85 percent of this association, and Riverwash makes up the remaining 15 percent.

Arizo soils consist of pale-brown, neutral gravelly loamy sand or loamy fine sand underlain by pale-brown, calcareous very cobbly loamy sand and very gravelly loamy sand.

The soils in this association are used for limited grazing in spring and for wildlife habitat. They also are a source of sand and gravel.

Soils of the Alluvial Fans and Terraces

This physiographic region is made up of alluvial fans and terraces in the western and southwestern parts of Antelope Valley, near Acton, near Saugus and Newhall, and south and east of Pearblossom. Rainfall is higher than in the Mojave Desert region.

Elevations in this physiographic region range from 2,600 to 3,900 feet in the western part of Antelope Valley and near Acton. They range from about 1,175 to 1,400 feet near Saugus and Newhall. The average annual rainfall is 9 to 16 inches. It is more reliable than the rainfall in the Mojave Desert, but it is likely to vary widely from the average. Dryland farming is marginal, and on many farms ground water is used to provide supplemental irrigation. Annual grasses, forbs, and oaks, and such low shrubs as California juniper and chamise, make up the vegetation in much of the area.

Two of the soil associations in the Antelope Valley Area are in this region, which includes small areas of the land types Riverwash, Sandy alluvial land, and Terrace escarpments. The two soil associations make up about 25 percent of the survey area.

7. Hanford-Ramona-Greenfield Association

Nearly level to moderately steep, well-drained, very deep soils that have a loamy sand to loam surface layer; on alluvial fans and terraces

Areas of this soil association are near Fairmont, Acton, Juniper Hills, and Leona Valley on alluvial fans and terraces. The soils are very deep, are well drained, and formed in alluvium from granitic rock. Slopes range from 0 to 30 percent. Elevations range from 2,600 to 3,900 feet. The average annual rainfall is 9 to 12 inches, the average annual temperature is 62° F., and the frost-free period is 210 to 260 days. Vegetation on the areas consists mainly of annual grasses and forbs, but junipers grow in scattered areas. The association makes up about 23 percent of the survey area.

Hanford soils make up about 45 percent of this association; Ramona soils, about 25 percent; and Greenfield soils, about 20 percent. The remaining 10 percent consists of Chino, Oakdale, and Vernalis soils and of the land type Terrace escarpments.

Hanford soils have a surface layer of pale-brown, slightly acid loamy sand to loam. Below is light yellowish-brown, slightly acid and neutral coarse sandy loam and gravelly loamy coarse sand.

Ramona soils are brown throughout. Their surface layer is slightly acid coarse sandy loam and sandy loam. The subsoil is slightly acid and neutral loam to sandy clay loam, and the substratum is neutral loam.

Greenfield soils have a surface layer of pale-brown and brown, slightly acid sandy loam. The subsoil is brown sandy loam and heavy sandy loam underlain by brown, neutral coarse sandy loam.

The soils of this association are used for dryland and irrigated crops. They also are used for limited grazing and wildlife habitat.

8. Yolo-Metz-Cortina Association

Nearly level to moderately sloping, well-drained to excessively drained, very deep soils that have a loam to loamy sand surface layer; on alluvial fans and flood plains

Soils in this association are mainly near Castaic, Saugus, and Newhall on alluvial fans and flood plains. They are well drained to excessively drained, are very deep, and formed in alluvium from sedimentary rock. Slopes range from 0 to 9 percent. Elevations range from 1,175 to 1,400 feet. The average annual rainfall is 14 to 16 inches, the average annual temperature is 63° F., and the frost-free period is 240 to 300 days. Annual grasses, forbs, and oaks make up the plant cover in most areas, but chamise grows in some places. This association occupies about 2 percent of the survey area.

Yolo soils make up about 40 percent of this association; Metz soils, about 25 percent; and Cortina soils, about 20 percent. The remaining 15 percent consists of Mocho, Sorrento, and Zamora soils.

Yolo soils are well drained. Their surface layer is grayish-brown, medium acid and slightly acid loam. The subsoil is grayish-brown, neutral loam, near silt loam, underlain by similar material that is light yellowish brown.

Metz soils are somewhat excessively drained and are neutral throughout. Their surface layer is brown loamy sand or loam. Below is brown loamy sand and light brownish-gray sand.

Cortina soils are excessively drained. The surface layer is pale-brown, slightly acid sandy loam or cobbly sandy loam. Below is pale-brown, slightly acid very gravelly sandy loam underlain by light yellowish-brown, neutral very cobbly sandy loam.

This association is used for many kinds of dryland and irrigated crops and for dryland pasture. It also is used for range, wildlife habitat, and homesites.

Soils of the Uplands

This physiographic region consists of upland foothills, mountains, ridges and fault scarps, and associated valley floors. The areas are along the northern and southern edges of the San Andreas Rift Zone, the southern flank of the Tehachapi Mountains, and the foothills of the San Gabriel, Sierra Pelona, and Liebre Mountain Ranges. The soils formed in material weathered from a wide variety of rocks, and rocks crop out in many places.

Elevations in this region range from about 1,250 to more than 6,500 feet. Average annual rainfall is 9 to 20 inches. The vegetation consists mainly of grasses and oaks or of chamise brush. The understory is chiefly annual grasses and forbs, but perennial grasses and junipers grow in some places.

Eight soil associations are in the foothills, mountains, and terraces. They make up about 30 percent of the survey area.

9. Sheridan-Lebec Association

Moderately steep to steep, well-drained soils that have a sandy loam or loam surface layer; moderately deep over granite or limestone; on foothills and mountains

This soil association is on foothills and mountains along the southern edge of the Tehachapi Mountains. These soils are moderately deep and are well drained. They formed in place in material from granite and limestone. Slopes range from 15 to 50 percent. Elevations range from 4,000 to 6,500 feet. The average annual rainfall is 12 to 20 inches, the average annual temperature is 55° F., and the frost-free season is 180 to 210 days. The vegetation is mainly annual grasses, forbs, and scrub oaks, but perennial grasses and junipers grow in some places. This association occupies about 3 percent of the survey area.

Sheridan soils make up about 70 percent of the association; Lebec soils, about 20 percent; and the land type Rock land, the remaining 10 percent.

Sheridan soils are slightly acid throughout. They have a surface layer of gray heavy sandy loam underlain by brown gravelly sandy loam. Broken and shattered granite is at a depth between 24 and 36 inches.

Lebec soils are calcareous throughout. They have a surface layer of brown and dark-brown loam and heavy loam. Below is dark-brown heavy loam underlain by hard limestone. Depth to limestone ranges from 30 to 48 inches. Outcrops of rock cover 5 to 10 percent of the surface.

The soils of this association are used for range, wildlife habitat, and watershed.

10. Anaverde-Godde Association

Moderately steep to steep, well-drained soils that have a loam surface layer; deep to shallow over schist; on foothills and mountains

Some areas of this soil association are on foothills and mountains in the upper part of the watershed of Cottonwood Creek, and others are along the foothills on the eastern edge of the Sierra Pelona Mountains east of Bouquet Reservoir. These soils are deep to shallow and are well drained. They formed in place in material weathered from schist, and outcrops of rock cover from 5 to 10 percent of the surface in places. Slopes range from 15 to 50 percent. Elevations range from 4,200 to 5,000 feet. The average annual rainfall is 12 to 20 inches, the average temperature is 55° F., and the frost-free season is 175 to 200 days. Annual grasses, forbs, and oaks cover most areas, but junipers and wild buckwheat grow in some places on the shallow soils. The association covers about 3 percent of the survey area.

Anaverde soils make up about 55 percent of this association, and Godde soils, about 45 percent.

Anaverde soils are moderately deep to deep and are slightly acid throughout. Their surface layer is dark grayish-brown and dark-brown loam. Below is grayish-brown light clay loam underlain by light yellowish-brown gravelly light clay loam. Hard, olive-gray schist generally is at a depth between 36 and 55 inches.

Godde soils are shallow and are slightly acid throughout. They consist of grayish-brown loam underlain by hard, dark-colored schist. Depth to the schist ranges from 14 to 20 inches.

All of this association is used for range, wildlife, recreation, and watershed.

11. Oak Glen-Gorman Association

Nearly level to steep, well-drained, very deep soils that have a sandy loam to loam surface layer; on alluvial fans and foothills

This soil association is along the southern edge of the Tehachapi Mountains and near Gorman. The Oak Glen soils are on alluvial fans and along drainageways, and the Gorman soils are on old granitic sediment in the foothills. Slopes range from 0 to 50 percent. Elevations range from 3,400 to 4,500 feet. The average annual rainfall is 14 to 16 inches, the average annual temperature is 55 to 57° F., and the frost-free season is 175 to 240 days. Annual grasses, forbs, and oaks cover the areas. The association occupies about 4 percent of the survey area.

The Oak Glen soils and the Gorman soils each occupy about 50 percent of this association.

Oak Glen soils have a surface layer of grayish-brown, slightly acid sandy loam, gravelly sandy loam, or loam. Below is grayish-brown and brown, slightly acid and medium acid fine sandy loam,

loamy coarse sand, and sandy loam. Slopes range from 0 to 9 percent.

Gorman soils have a surface layer of dark-gray and dark grayish-brown, neutral to medium acid sandy loam. Below is brown, medium acid and strongly acid light sandy clay loam and sandy clay loam underlain by pink, strongly acid light sandy clay loam. Slopes range from 9 to 50 percent.

The soils of this association are used for dryland grain, wildlife habitat, and watershed.

12. Las Posas-Toomes-Temescal Association

Strongly sloping to steep, well-drained or somewhat excessively drained soils that have a loam or sandy loam surface layer; moderately deep to shallow over basalt or andesite; on foothills

Some areas of this soil association are in the foothills along the San Andreas Rift Zone and others are near Acton, Agua Dulce, and Vincent. These upland soils are moderately deep to shallow and are well drained or somewhat excessively drained. They formed in place in material from basalt or andesite. Slopes range from 9 to 50 percent. Elevations range from 2,600 to 3,500 feet. The average annual rainfall is 9 to 16 inches, the average annual temperature is 61 to 62° F., and the frost-free season is 210 to 275 days. Annual grasses, forbs, chamise, yucca, and juniper make up the plant cover. This association covers 3 percent of the survey area.

Las Posas soils make up 40 percent of this association; Toomes soils, 25 percent; and Temescal soils, 20 percent. The remaining 15 percent consists of Wyman soils and of the land type Rock land.

Las Posas soils are moderately deep and are well drained. They have a surface layer of dark-brown, neutral loam. The subsoil is dark-brown and reddish-brown clay loam and heavy clay loam underlain by hard basalt at a depth between 24 and 32 inches. Outcrops of rock cover 5 to 10 percent of the surface in places.

Toomes soils are shallow, are somewhat excessively drained, and are neutral throughout. Their surface layer is dark grayish-brown loam, and their subsoil is yellowish-brown loam. Hard basalt is at a depth between 12 and 18 inches, and outcrops of rock cover 5 to 10 percent of the surface.

Temescal soils are shallow, are well drained, and are slightly acid throughout. Their surface layer is light brownish-gray sandy loam, and their subsoil is light brownish-gray heavy sandy loam. Slightly weathered light-gray andesite is at a depth between 14 and 20 inches.

The soils of this association are used for range, wildlife habitat, and watershed.

13. Vista-Amargosa Association

Strongly sloping to steep, well-drained to excessively drained soils that have a coarse sandy loam surface layer; moderately deep to shallow over granite; on foothills and mountains

Areas of this soil association are on foothills and mountains scattered mainly throughout the middle and southern parts of the survey area, but some areas are in the western part. The soils are moderately deep to shallow over granite and are well drained to excessively drained. Slopes range from 9 to 55 percent. Elevations range from 2,200 to 3,900 feet. The average annual rainfall is 14 to 16 inches, the average annual temperature is 61 to 62° F., and the frost-free season is 210 to 240 days. The plant cover is mainly annual grasses and forbs, but California juniper and manzanita grow in some places. This association covers about 6 percent of the survey area.

Vista soils make up about 55 percent of this association, and Amargosa soils, about 40 percent. The remaining 5 percent consists of the land type Rock land.

Vista soils are moderately deep and are well drained. They have a surface layer of brown, slightly acid coarse sandy loam. The subsoil is brown, neutral sandy loam underlain by yellowish-brown, neutral coarse sandy loam. Hard granitic rock is at a depth between 28 and 38 inches.

Amargosa soils are shallow, are excessively drained, and are slightly acid throughout. They have a surface layer of brown and yellowish-brown coarse sandy loam. Below is yellowish-brown gravelly sandy loam. Depth to hard granitic rock is between 14 and 20 inches, and outcrops of rock cover from 2 to 10 percent of the surface.

The soils of this association are used for dryland grain, wildlife habitat, and watershed.

14. Ojai-Agua Dulce Association

Gently sloping to steep, well-drained, very deep to moderately deep soils that have a loam or stony loam surface layer; on terraces and foothills

The soils of this association are near Newhall, Saugus, and Solemint. The Ojai soils are on terraces, and the Agua Dulce soils are on foothills. These soils are very deep to moderately deep and are well drained. They formed in semiconsolidated to unconsolidated sediment from sedimentary rock. Slopes range from 2 to 50 percent. Elevations range from 1,300 to 2,700 feet. The average annual rainfall is 12 to 16 inches, the average annual temperature is 63° F., and the frost-free season ranges from 265 to 300 days. The vegetation is mainly annual grasses, forbs, and oaks but includes scattered California junipers, chamise, and manzanita. This association makes up about 2 percent of the survey area.

Ojai soils make up about 65 percent of this association, and Agua Dulce soils, about 30 percent. The remaining 5 percent consists of Saugus soils.

Ojai soils are very deep and have a surface layer of grayish-brown and brown, slightly acid loam and heavy loam. Their subsoil is reddish-brown and brown, slightly acid and neutral clay loam. Below is reddish-yellow, slightly acid sandy loam.

Agua Dulce soils are moderately deep to deep and

are slightly acid throughout. Their surface layer is grayish-brown stony loam and heavy loam. The subsoil is brown very cobbly and gravelly clay loam underlain by light yellowish-brown very gravelly loamy coarse sand. Depth to parent material of weakly consolidated conglomerate ranges from 36 to 60 inches.

The Ojai soils are used for irrigated and dryland crops and as homesites. In addition both the Ojai and Agua Dulce soils are used for range, watershed, and wildlife habitat.

15. Gaviota-Millsholm Association

Moderately steep or steep, well-drained and somewhat excessively drained soils that have a sandy loam or loam surface layer; shallow over sandstone or shale; on foothills

This soil association is on foothills and mountains in the southwestern part of the survey area. These soils are well drained and somewhat excessively drained and formed in material from sandstone or shale. Slopes range from 15 to 50 percent. Elevations range from 2,000 to 3,500 feet. The average annual rainfall is 12 to 16 inches, the average annual temperature is 62° F., and the frost-free season ranges from 240 to 275 days. Annual grasses and forbs and chamise make up the plant cover. The association covers about 3 percent of the survey area.

Gaviota soils make up about 50 percent of this association, and Millsholm soils, about 45 percent. The remaining 5 percent consists of Gazos soils.

Gaviota soils are well drained and somewhat excessively drained and are slightly acid throughout. They consist of light brownish-gray sandy loam. Hard sandstone bedrock is at a depth between 14 and 20 inches, and outcrops of rock cover 2 to 10 percent of the surface.

Millsholm soils are well drained and are neutral throughout. The surface layer is pale-brown loam, and it is underlain by brown heavy loam. Hard shale and fine-grained sandstone are at a depth between 14 and 20 inches, and outcrops of rock cover 2 to 4 percent of the surface.

All of this soil association is used for range, wildlife habitat, recreation, and watershed.

16. Saugus-Castaic-Balcom Association

Gently sloping to very steep, well-drained soils that are loam to silty clay loam throughout; deep to moderately deep over soft sandstone or shale; on foothills and mountains

Some areas of this soil association are adjacent to Ventura County, and others are north and south of the Santa Clara River and its tributaries near Saugus. These soils are on foothills and mountains. They are deep to moderately deep and are well drained. They formed in material from weakly consolidated sediment and shale. Slopes range from 2 to 65 percent. Elevations range from 1,250 to 2,250 feet. The average annual rainfall is 14 to 16 inches, the average annual temperature is 63° F., and the frost-free season is 275 to 300 days. Annual grasses, forbs, yucca, chamise, and scattered stands of stipa make up the vegetation. This association covers about 6 percent of the survey area.

Saugus soils make up about 50 percent of this association; Castaic soils, about 25 percent; and Balcom soils, about 20 percent. Mocho, Sorrento, and other alluvial soils, in small valleys and on fans, make up the remaining 5 percent.

Saugus soils are moderately deep to deep. Their surface layer is grayish-brown, neutral loam. Below is grayish-brown, slightly acid loam underlain by weakly consolidated sediment at a depth between 24 and 56 inches.

Castaic soils are moderately deep and have a surface layer of pale-brown, neutral silty clay loam. Below is yellowish-brown, neutral silty clay loam that is calcareous in the lower part. Broken, weathered, calcareous shale is at a depth between 20 and 44 inches.

Balcom soils are moderately deep. They have a surface layer of pale-brown, mildly alkaline silty clay loam. Below is pale-brown, calcareous silty clay loam. Depth to calcareous, somewhat weathered and broken shale is between 26 and 40 inches.

The more gently sloping areas of this association are used for dryland grain, but the steeper areas are used for range, wildlife, and recreation. In addition, the Saugus soils are used for homesites.

This section provides detailed information about the soils in the Area. It describes each soil series, and then each soil, or mapping unit. The soils are described in alphabetical order.

The description of a soil series mentions features that apply to all of the soils of that series. Differences among the soils of one series are pointed out in the descriptions of the individual soils, or are apparent in the name.

A profile typical of each series is described in detail in the first mapping unit. This typifying profile is for scientists, engineers, and others who need to make highly technical soil interpretations. The layers, or horizons, are designated by symbols such as A1, B21t, and C1. These symbols have special meaning for soil scientists. Many readers, however, need only remember that symbols beginning with "A" are for surface soil; those with "B" are for subsoil; those with "C" are for substratum, or parent material; and those with "R" are for bedrock. All measurements refer to depth from the surface.

The color of each horizon is described in words, such as yellowish brown, and is also indicated by symbols for hue, value, and chroma, such as 10YR 5/4. These symbols, which are called Munsell color notations, are used by soil scientists to evaluate the color of the soil precisely (19) [1]. Unless otherwise stated, all color terms in the survey are for dry soil.

The texture of the soil refers to the content of sand, silt, and clay. It is determined by the way the soil feels when rubbed between the fingers, and it is checked by laboratory analyses. Each mapping unit is identified by a textural class name, such as "fine sandy loam." This name refers to the texture of the surface layer or A horizon.

The structure is indicated by the way the individual soil particles are arranged in larger grains, or aggregates, and the amount of pore space between grains. The structure of the soil is described by terms that denote strength or grade, size, and shape of the aggregates. For example, a layer may consist of soil materials that have "weak, fine, blocky structure."

Boundaries between the horizons are described so as to indicate their thickness and shape. The terms for thickness are abrupt, clear, gradual, and diffuse. The shape of the boundary is described as smooth, wavy, irregular, or broken.

Other terms used for describing the soils are defined in the Glossary. For more general information about the soils, the reader can refer to the section "General Soil Map," in which the broad patterns of soils are described. The approximate acreage and proportionate extent of the soils are given in table 1, p. 66, and their location and extent are shown on the detailed soil map at the back of this survey.

[1] Italic numbers in parentheses refer to literature cited p. 183.

Adelanto Series

The Adelanto series consists of well-drained soils that have formed in granitic alluvium. These soils are on alluvial fans and terraces. Slopes range from 0 to 5 percent. The vegetation is mainly annual grasses and forbs, but desert stipa and scattered creosotebushes, sagebrush, junipers, and Joshua-trees grow in some places. Elevations range from 2,500 to 2,800 feet. The average annual precipitation ranges from 4 to 9 inches, the average annual temperature is about 62° F., and the frost-free season ranges from 240 to 260 days. Adelanto soils are associated with the Cajon, Hesperia, and Mohave soils.

In a typical profile the surface layer is brown and light-brown coarse sandy loam and sandy loam about 27 inches thick. The subsoil is light-brown and reddish-brown and brown heavy sandy loam about 53 inches thick. Just below is brown coarse sandy loam. In some places the surface layer is loamy sand, and in other places the profile is gravelly throughout.

These soils are used for irrigated crops and as range in spring.

Adelanto coarse sandy loam, 0 to 2 percent slopes (AcA).--This soil occupies alluvial fans. Some areas extend from south of Lancaster to Quartz Hill, and others are near Palmdale, Littlerock, and Llano.

Typical profile (at the intersection of Avenue M-8 and 37th Street West, NE1/4SE1/4 sec. 6, T. 6 N., R. 12 W.):

A1--0 to 16 inches, brown (10YR 5/3) coarse sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine and fine roots; common micro irregular pores and a few micro and very fine tubular pores; slightly acid (pH 6.5); gradual, wavy boundary; horizon 8 to 16 inches thick.

A3--16 to 27 inches, light-brown (7.5YR 6/4) sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard when dry, friable when moist; nonsticky and nonplastic when wet; common very fine roots and a few fine roots; common micro irregular pores and a few micro tubular pores; neutral (pH 7.0); gradual, wavy boundary; horizon 4 to 12 inches thick.

B1--27 to 41 inches, light-brown (7.5YR 6/4) sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; common micro irregular pores and a few very fine tubular pores; a few thin clay films occur as bridges between mineral grains; strongly effervescent; contains soft masses of lime; moderately alkaline (pH 8.0); clear, wavy boundary; horizon 14 to 16 inches thick.

B21t--41 to 50 inches, reddish-brown (5YR 5/4) heavy sandy loam, reddish brown (5YR 4/4) moist; weak, fine and medium, angular blocky structure; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; a few micro roots; a few micro irregular pores and a few very fine tubular pores; a few moderately thick clay films on ped faces and common moderately thick clay films as bridges and in pores; about 10 to 15 percent, by volume, is fine gravel; slightly effervescent; disseminated lime; moderately alkaline (pH 8.2); clear, wavy boundary; horizon 8 to 10 inches thick.

B22t--50 to 64 inches, reddish-brown (5YR 5/4) heavy sandy loam near loam, reddish brown (5YR 4/4) moist; weak, fine and medium, angular blocky structure; very hard when dry, firm when moist, slightly sticky and slightly plastic when wet; a few micro roots; a few micro irregular pores and a few very fine tubular pores; about 15 percent, by volume, is fine gravel; common moderately thick clay films on ped faces and a few thin clay films as bridges; strongly effervescent; disseminated lime; moderately alkaline (pH 8.4); clear, wavy boundary; horizon 12 to 14 inches thick.

B3t--64 to 80 inches, brown (7.5YR 5/4) heavy sandy loam, dark brown (7.5YR 4/4) moist; massive; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; a few micro irregular pores; about 10 percent, by volume, is fine gravel; a few moderately thick clay films in pores and a few thin clay films as bridges; strongly effervescent; disseminated lime; moderately alkaline (pH 8.4); clear, wavy boundary; horizon 16 to 18 inches thick.

C--80 to 86 inches, brown (7.5YR 5/4) coarse sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; slightly effervescent; disseminated lime; moderately alkaline (pH 8.4).

The A horizon is dark brown, dark grayish brown, light brown, brown, or reddish brown. Texture generally is coarse sandy loam but ranges to sandy loam and in many places has a cover of overwash. Typically, the A horizon is noneffervescent, though in places it is slightly effervescent. The A3 horizon is lacking in places.

In color the B1 horizon is light brown or brown. The texture ranges from sandy loam to loam, and the structure is subangular blocky or the horizon is massive. Reaction ranges from mildly alkaline to moderately alkaline. The B2t horizon ranges from strong brown to reddish brown in color, and from heavy sandy loam to loam in texture. Thin layers that differ in color and texture are common. Structure of the B2t horizon generally is subangular or angular blocky, but weak prisms occur in a few places. Reaction ranges from mildly alkaline to moderately alkaline. Effervescence ranges from slight to strong. The content of gravel ranges from 10 to 15 percent. The B3t horizon is brown or reddish yellow in color and ranges from mildly alkaline to moderately alkaline in reaction.

The C horizon is brown or light yellowish brown in color. It is stratified, and it ranges from loamy coarse sand to coarse sandy loam in texture. Reaction is moderately alkaline to strongly alkaline.

Permeability is moderate in this soil. Available water holding capacity is 7.5 to 9.0 inches. Fertility is low, runoff is very slow, and the water erosion hazard is slight. Soil blowing is a moderate hazard. Plant roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Cajon loamy sand and of Mohave coarse sandy loam.

This Adelanto soil is used for irrigated crops and for range in spring. Alfalfa is the principal crop in irrigated areas. Capability unit IIe-4 (30) irrigated, VIIe-1 (30) dryland; range site 7.

Adelanto loamy sand, 2 to 5 percent slopes (AaB).--The surface layer of this soil is pale-brown loamy sand about 14 to 18 inches thick. In most places slopes range from 3 to 5 percent. The available water holding capacity is 6.0 to 8.0 inches. Runoff is slow, the hazard of water erosion is slight, and the hazard of soil blowing is moderate.

Included with this soil in mapping are small areas of Cajon loamy sand and of Mohave coarse sandy loam.

This Adelanto soil is used for range and as wildlife habitat. It is suited to most irrigated crops grown in the survey area. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Adelanto gravelly sandy loam, 2 to 5 percent slopes (AdB).--This soil is on terraces east of Pearblossom. The surface layer is pale-brown gravelly sandy loam about 10 to 14 inches thick. A few cobblestones and other stones are on the surface. Slopes are fairly long and commonly range from 2 to 3 percent. In places the relief is undulating. A few deep gullies cut the areas. Available water holding capacity is 5.0 to 6.5 inches. Runoff is slow, and hazard of water erosion is slight.

Included with this soil in mapping are small areas of Cajon loamy fine sand and of Mohave coarse sandy loam.

This Adelanto soil is used only for range in spring. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Agua Dulce Series

In the Agua Dulce series are well-drained soils that formed in uplifted nonmarine sedimentary alluvium. These soils are on foothills in the uplands. Slopes range from 30 to 50 percent. The vegetation

is mainly annual grasses and forbs, but California juniper is scattered over the areas. Elevations range from 2,200 to 2,700 feet. Average annual precipitation ranges from about 12 to 14 inches, average annual temperature is about 63° F., and the frost-free season ranges from 265 to 285 days. Agua Dulce soils are associated with Castaic and Las Posas soils.

In a typical profile the surface layer is grayish-brown stony loam and loam about 6 inches thick. The subsoil is brown very cobbly and gravelly clay loam about 14 inches thick. Just below is light yellowish-brown very gravelly loamy coarse sand. Weakly consolidated conglomerate is at a depth of about 40 inches.

These soils are used for range, wildlife habitat, and watershed.

Agua Dulce stony loam, 30 to 50 percent slopes (AgF).--This is the only Agua Dulce soil mapped in the Area. It is in mountainous areas in the southern part of Agua Dulce Canyon.

Typical profile (0.7 mile south of Davenport Road, west of Agua Dulce, on the powerline access road; SE1/4NW1/4 sec. 34, T. 5 N., R. 14 W.):

A1--0 to 3 inches, grayish-brown (10YR 5/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak, very fine and fine, granular structure; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro and a few very fine roots; common micro and a few very fine tubular pores; about 10 to 15 percent, by volume, is stones, cobblestones, and fine gravel; slightly acid (pH 6.5); abrupt, smooth boundary; horizon 3 to 6 inches thick.

A3--3 to 6 inches, grayish-brown (10YR 5/2) heavy loam, dark brown (10YR 3/3) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro and a few very fine roots; a few fine tubular pores; a few thin clay films occur as bridges between mineral grains; about 10 to 12 percent, by volume, is fine gravel; slightly acid (pH 6.5); clear, smooth boundary; horizon 3 to 6 inches thick.

B2t--6 to 20 inches, brown (7.5YR 5/4) very cobbly and gravelly clay loam, dark brown (7.5YR 4/4) moist; strong, medium and coarse, angular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; common micro and a few very fine roots, mostly between ped faces; common micro and very fine tubular pores; many moderately thick clay films occur as bridges between mineral grains; common moderately thick clay films in pores, and a few moderately thick clay films on ped faces; by volume, about 25 percent of the horizon is cobblestones and 30 to 35 percent is gravel; slightly acid (pH 6.5); abrupt, wavy boundary; horizon 12 to 20 inches thick.

C1--20 to 40 inches, light yellowish-brown (10YR 6/4) very gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; massive to very weakly consolidated; hard when dry, firm when moist, nonsticky and nonplastic when wet; a few micro roots; a few micro irregular pores; by volume, about 10 percent of the horizon is cobblestones and 65 to 75 percent is gravel; slightly acid (pH 6.5); gradual, wavy boundary; horizon 8 to 28 inches thick.

C2--40 to 48 inches, weakly consolidated conglomerate.

Cobblestones and other stones occupy up to 15 percent of the A horizon, and sandstone conglomerate crops out on about 2 percent of the total area. The A horizon ranges from grayish brown to brown in color and from stony loam to loam in texture. In places the A horizon is hard and massive when dry. In areas that are moist, however, or are under shrubs and a thick litter of leaves, structure ranges to moderate blocky in many places. The A horizon is strongly acid to slightly acid, and its content of organic matter is moderately low to medium. The B2t horizon is brown to strong brown in color. It generally has angular blocky structure, but it is massive in places. The amount of gravel and cobblestones below the A horizon ranges from 55 to nearly 85 percent, by volume.

Permeability is moderately slow in this soil. Available water holding capacity is 3.0 to 4.0 inches. Fertility is moderate, runoff is rapid, and the erosion hazard is high. Roots can penetrate to a depth between 36 and 60 inches. Thin lenses of sandstone conglomerate generally limit the depth to which plant roots can penetrate.

Included with this soil in mapping are soils on Fairmont Butte that have a stony surface layer like that in the Agua Dulce soil, but that have a subsoil and substratum that are between 20 and 40 percent, by volume, gravel and cobblestones. Also included, near Escondido Canyon, are small areas of Millsholm rocky loam, Ojai loam, and Saugus loam. Other included small areas consist of Agua Dulce stony loam, on 15 to 30 percent slopes, and small areas of Agua Dulce soil that has a clay loam surface layer.

Agua Dulce stony loam, 30 to 50 percent slopes, is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (19) dryland; range site 2.

Amargosa Series

In the Amargosa series are excessively drained soils that formed in material weathered from granitic rock. Slopes range from 9 to 55 percent. The vegetation is mainly annual grasses and scattered California junipers and manzanita bushes. Elevations range from 2,600 to 3,500 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 61° F., and the frost-free season ranges from about 210 to 240 days.

The surface layer in a typical profile is brown and yellowish-brown coarse sandy loam about 13 inches thick. Just below is yellowish-brown gravelly sandy loam about 5 inches thick. Hard granitic rock is at a depth of about 18 inches.

These soils are used mostly for recreation, wildlife habitat, and watershed.

Amargosa rocky coarse sandy loam, 9 to 55 percent slopes, eroded (AmF2).--This is the only Amargosa soil mapped in the Area. It is on hilly uplands in the central part of the survey area. In most places from about 25 to 40 percent of the original surface soil has been removed through moderate sheet and rill erosion. Rock outcrops cover 2 to 10 percent of the surface, and many areas are cut by shallow gullies.

Typical profile (0.7 mile from the first right hand turn on the Aliso Canyon Road; about 900 feet due east up the hill from the concrete marker placed at the section corner and the junction of an unimproved road; NW1/4NW1/4 sec. 5, T. 4 N., R. 12 W.):

A11--0 to 2 inches, brown (10YR 5/3) coarse sandy loam, dark brown (10YR 4/3) moist; weak, fine and medium, subangular blocky structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; common micro and very fine roots; common micro irregular pores; slightly acid (pH 6.2); abrupt, smooth boundary; horizon 2 to 3 inches thick.

A12--2 to 13 inches, yellowish-brown (10YR 5/4) coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; about 3 to 5 percent, by volume, is gravel; slightly acid (pH 6.5); gradual, wavy boundary; horizon 8 to 11 inches thick.

C--13 to 18 inches, yellowish-brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots; common micro irregular pores; about 20 percent, by volume, is fine gravel; slightly acid (pH 6.5); gradual, wavy boundary; horizon 4 to 6 inches thick.

R--18 inches, hard granitic rock.

The A horizon is pale brown, light brown, brown, light yellowish brown, or yellowish brown. It ranges from coarse sandy loam to sandy loam in texture. In many places a thin layer of overwash that consists of granitic gravel covers the areas. From a depth of 10 inches to bedrock, gravel makes up less than 35 percent, by volume, of the profile. A few cobblestones and other stones are on the surface. Depth to bedrock commonly is about 18 inches, but it ranges from 14 to 20 inches.

Permeability is moderately rapid in this soil. Available water holding capacity is 1.0 to 1.5 inches. Fertility is very low, runoff is medium to rapid, and the hazard of water erosion is moderate to high. In most places roots can penetrate to a depth of about 14 to 20 inches.

Included with this soil in mapping are small areas of Godde rocky loam, of Temescal sandy loam, and of Vista coarse sandy loam. Also included are small areas that have a surface layer of very fine sandy loam. Other included small areas are not rocky, and a few included areas, generally less than 40 acres in size, have a surface layer that is gray or dark gray. Still other included areas consist of a soil on Holcomb Ridge, near Bobs Gap, that is underlain by hard limestone.

Amargosa rocky coarse sandy loam, 9 to 55 percent slopes, eroded, is used as range and for recreation, wildlife, and water supply purposes. Capability unit VIIe-1 (19) dryland; range site 4.

Anaverde Series

The Anaverde series consists of well-drained soils that formed in material weathered from schist. These soils are on foothills and mountains. Slopes range from 15 to 50 percent. The vegetation is grasses and oaks. Elevations range from 4,700 to about 5,000 feet. Average annual precipitation is 12 to 16 inches, average annual temperature is about 55° F., and the frost-free season ranges from about 175 to 200 days. Anaverde soils are associated with Amargosa, Godde, and Vista soils.

In a typical profile the surface layer is dark grayish-brown and dark-brown loam about 22 inches thick. Below is grayish-brown and light yellowish-brown light clay loam and gravelly light clay loam underlain by schist at a depth of about 55 inches.

These soils are used for range, as wildlife habitat, and for recreation and watershed purposes.

Anaverde loam, 15 to 30 percent slopes (AnE).--Some areas of this soil are on Pelona Ridge and others are along the upper reaches of Cottonwood Creek, west and south of White Oak Lodge.

Typical profile (along the road to microwave relay station, 1.5 miles south of the signpost at the summit of the road leading to Pelona Mountain and Anaverde Creek that reads Pelona Mountain and Anaverde Creek; SE1/4 sec. 4, T. 5 N., R. 13 W.):

A11--0 to 14 inches, dark grayish-brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate, fine, crumb structure; soft when dry, very friable when moist, slightly sticky and slightly plastic when wet; many very fine and common micro roots; common micro irregular pores; slightly acid (pH 6.5); gradual, smooth boundary; horizon 12 to 14 inches thick.

A12--14 to 22 inches, dark-brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate, fine and medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic

when wet; common micro and very fine roots and a few fine roots; common micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.5); gradual, smooth boundary; horizon 8 to 10 inches thick.

C1--22 to 44 inches, grayish-brown (10YR 5/2) light clay loam, dark grayish brown (10YR 4/2) moist; weak, medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and plastic when wet; common micro and very fine roots; common micro irregular pores; colors are mixed; about 25 percent is strong brown (7.5YR 5/6) moist, and 10 percent is olive brown (2.5Y 4/4) moist; 10 to 20 percent, by volume, is weathered fragments of schist; slightly acid (pH 6.2); gradual, smooth boundary; horizon 8 to 22 inches thick.

C2--44 to 55 inches, light yellowish-brown (2.5Y 6/4) gravelly light clay loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; about 25 to 35 percent, by volume, is weathered fragments of schist; slightly acid (pH 6.2); clear, smooth boundary; horizon 8 to 10 inches thick.

R--55 inches, hard olive-gray schist.

The A1 horizon generally is dark grayish brown or dark brown, but in places it is gray or grayish brown. Structure generally is crumb or subangular blocky, but in some places it is granular. The C horizon is grayish brown, light yellowish brown, or light olive brown. It ranges from light clay loam to gravelly light clay loam in texture and is 27 to 32 percent clay.

Because the content of mica is high, this soil feels smooth and greasy. Structure is angular blocky or the soil is massive. Depth generally is about 36 to 55 inches, but it varies from place to place and within a short distance.

Permeability is moderate in this soil. Available water holding capacity is 5.5 to 9.0 inches, depending upon soil depth. Fertility is high, runoff is medium, and the erosion hazard is moderate.

Included with this soil in mapping are small areas of Godde rocky loam and of Vista coarse sandy loam. Outcrops of bedrock cover as much as 2 percent of the area in places, and on the north slopes, as much as 5 percent of the area.

This Anaverde soil is used for range, wildlife, and recreation. Capability unit VIe-1 (20) dryland; range site 2.

Anaverde rocky loam, 30 to 50 percent slopes (ApF).--Some areas of this soil are along the upper reaches of Cottonwood Creek and others are on Pelona Ridge. Slopes are dominantly 35 to 45 percent, and outcrops of bedrock cover from 5 to 10 percent of the areas. Runoff is rapid, and the erosion hazard is high.

Included with this soil in mapping are some areas, less than 30 acres in size, where sheet and rill erosion are moderate. Also included are small areas of Anaverde loam, 15 to 30 percent slopes, and of Godde rocky loam, 30 to 50 percent slopes.

This Anaverde soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (20) dryland; range site 2.

Arizo Series

In the Arizo series are excessively drained soils that formed in mixed alluvium derived chiefly from granitic rock but partly from schistose rock. These soils are on alluvial fans. Slopes are 0 to 5 percent. The vegetation consists of stands of such desert shrubs as creosotebush, Mormon tea, and rabbitbrush that have a thin understory of annual grasses and forbs. Elevations range from 2,950 to 3,100 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is about 62° F., and the frost-free season is about 240 to 260 days. Arizo soils are associated with the Cajon and Hesperia soils.

Typically the surface layer is pale-brown, gravelly loamy sand, about 3 inches thick. Below is pale-brown very cobbly and very gravelly loamy sand to a depth of 60 inches or more.

These soils are used for spring grazing, as a source of gravel, and as wildlife habitat.

Arizo gravelly loamy sand, 0 to 5 percent slopes (AsB).--This soil is on alluvial fans along Big Rock Creek and Little Rock Creek.

Typical profile (1.2 miles northwest of the junction of Longview Road and Avenue W; SW1/4NE1/4 sec. 25, T. 5 N., R. 10 W.):

C1--0 to 3 inches, pale-brown (10YR 6/3) gravelly loamy sand, brown (10YR 5/3) moist; massive; soft when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; about 15 percent, by volume, is gravel; neutral (pH 6.8); gradual, smooth boundary; horizon 3 to 6 inches thick.

C2--3 to 32 inches, pale-brown (10YR 6/3) very cobbly loamy sand, brown (10YR 5/3) moist; single grain; loose when dry, hard when moist, nonsticky and nonplastic when wet; common micro and very fine roots and a few fine and medium roots; about 75 percent, by volume, of the upper half of the horizon and 60 percent of the lower half is cobblestones; below a depth of 14 inches, about 15 percent of the cobblestones are coated with lime on the underside; neutral (pH 6.8); horizon 28 to 32 inches thick.

C3--32 to 60 inches, pale-brown (10YR 6/3) very gravelly loamy sand; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; a few micro, very fine, and fine roots; common micro irregular pores; by volume, about 25 percent is cobblestones and 65 percent is pebbles; about 85

percent of the cobblestones and pebbles are slightly effervescent and have lime on the underside; a few very fine strata of sandy loam; slightly effervescent; mildly alkaline (pH 7.5).

The C1 horizon generally is very pale brown, pale brown, or light yellowish brown, but in a few places it is brown. Texture ranges from gravelly loamy sand to cobbly sandy loam. Cobblestones and gravel occupy from 10 to 30 percent of the surface area. Color of the C2 and C3 horizons is pale brown. Gravel and cobblestones make up from 60 to nearly 90 percent, by volume, of the C2 and C3 horizons, and sand fills the interstices. The sand is single grain or is massive. The content of lime in the profile ranges from very slight to slight. Reaction ranges from neutral to moderately alkaline, and generally is more alkaline with increasing depth.

Permeability of this soil is very rapid. Available water holding capacity is 2 to 3 inches, and fertility is very low. Runoff is very slow. The hazard of wind erosion is moderate. Roots can penetrate to a depth of 60 inches.

Included with this soil in mapping are small areas of Cajon loamy fine sand on 2 to 9 percent slopes, and of Riverwash. Also included are small areas of Arizo gravelly loamy sand on 6 to 12 percent slopes.

This Arizo soil is used for range, as a source of gravel, and as wildlife habitat. Capability unit VIIe-4 (30) dryland; range site 8.

Arizo loamy fine sand, 0 to 2 percent slopes (AtA).--This soil is along Little Rock Creek and Big Rock Creek, west and east of Littlerock. The surface layer is 20 to 24 inches thick in most places. Depth to very gravelly material is as much as 34 inches or as little as 12 inches. The surface layer has been reworked by wind, and the soil is subject to blowing when the wind is strong. Windblown hummocks, 18 to 24 inches high, generally occupy about 50 to 60 percent of the surface, but near Littlerock as little as 25 percent of the area is hummocky. Available water holding capacity is 3 to 4 inches, fertility is low, and the hazard of soil blowing is high.

Included with this soil in mapping are areas that have a surface layer of fine sand and some areas of fine sandy loam. These areas are less than 10 acres in size. Also included are long, narrow areas of Riverwash.

This Arizo soil is used only as range in spring. Capability unit IVe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Ayar Series

The Ayar series consists of well-drained soils on uplands that have formed in lacustrine sediment. Slopes are 5 to 15 percent. Annual grasses and forbs make up the vegetation. Elevations range from 3,250 to 3,300 feet. Average annual precipitation ranges from 9 to 12 inches, average annual temperature is about 59° F., and the frost-free season ranges from about 210 to 240 days. Ayar soils are associated with the Oak Glen soils.

In a typical profile the surface layer is pale-brown heavy clay loam about 13 inches thick. Below is grayish-brown silty clay about 27 inches thick, underlain by white, calcareous clay loam that extends to a depth of 60 inches or more.

Ayar soils are used only for range.

Ayar clay loam, 5 to 15 percent slopes (AyD).--This is the only Ayar soil mapped in the Area. It is on uplifted lacustrine deposits in Kern County on the Tejon Ranch.

Typical profile (about 0.5 mile northwest of the headquarters of the old ranch and south of the mouth of Cottonwood Canyon; SW1/4SE1/4 sec. 36, R. 18 W., T. 9 N.; section corners projected):

A1--0 to 13 inches, pale-brown (10YR 6/3) heavy clay loam, brown (10YR 5/3) moist; moderate, fine, subangular blocky structure; hard when dry, friable when moist, sticky and plastic when wet; many micro and very fine roots; common micro irregular pores; many vertical cracks 1/2 inch wide extend from surface down through horizon; violently effervescent; disseminated lime; moderately alkaline (pH 8.4); gradual, smooth boundary; horizon 12 to 14 inches thick.

C1--13 to 40 inches, grayish-brown (10YR 5/2) silty clay, dark grayish brown (10YR 4/2) moist; strong, medium and coarse, angular blocky structure; very hard when dry, very firm when moist, sticky and very plastic when wet; common micro roots; common micro and very fine irregular pores; 2 to 3 slickenside faces intersect; about 5 to 8 vertical cracks that are 3/8 to 1/2 inch wide at a depth of 30 inches; strongly effervescent; disseminated lime; a few hard rounded nodules of lime that are 1/4 to 3/8 inch in diameter; strongly alkaline (pH 8.8); gradual, smooth boundary; horizon 26 to 28 inches thick.

C2--40 to 62 inches, white (10YR 8/1) clay loam, light gray (10YR 7/2) moist; massive; hard when dry, firm when moist, sticky and plastic when wet; 5 to 10 percent, by volume, is hard rounded nodules of lime that are 1/2 to 3/4 inch in diameter; violently effervescent; disseminated lime; strongly alkaline (pH 8.6).

The A1 horizon is pale brown or grayish brown in color and heavy clay loam to clay in texture. The C1 horizon is grayish brown or brown in color. It is strongly effervescent to violently effervescent. Color of the C2 horizon is white or light brownish gray. Texture is clay loam or silty clay, and the horizon is strongly effervescent to violently effervescent.

Permeability of this soil is slow, available water holding capacity is 8 to 10 inches, and fertility is low. Runoff is slow to medium, and the

hazard of erosion is slight to moderate. Plant roots can penetrate to a depth of 60 inches, but when the soil is dry, they can only reach the upper part of the C horizon with difficulty.

Included with this soil in mapping are small areas of Oak Glen loam. Also included are small areas of an unnamed soil that has a dark grayish-brown or very dark grayish-brown surface layer.

Ayar clay loam, 5 to 15 percent slopes, is used only for range. Capability unit IVe-1 (19) irrigated; range site 1.

Balcom Series

In the Balcom series are well-drained soils that formed in material from calcareous soft shale and sandstone. These soils are on uplands. Slopes range from 9 to 65 percent. On the south slopes the vegetation is mainly annual grasses and forbs, though brush and stipa, a perennial grass, grow in some areas. On the north slopes the vegetation is similar but includes more brush. Elevations range from 1,250 to 1,500 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 63° F., and the frost-free season is 275 to 300 days. Balcom soils are associated with the Castaic and Saugus soils.

The surface layer in a typical profile is pale-brown, silty clay loam about 10 inches thick. Below is pale-brown, moderately alkaline silty clay loam underlain by soft sandstone and shale at a depth of 26 to 40 inches.

These soils have moderately slow permeability. Available water holding capacity is 5 to 7 inches, and fertility is moderate. Plant roots generally can penetrate to a depth of about 28 to 36 inches. In some places, however, roots can penetrate only to a depth of 26 inches, and in other places they can reach a depth of 40 inches.

Balcom soils are used for dryland small grains and pasture and range. They also are used as wildlife habitat and for watershed and recreational purposes. In this survey area Balcom soils are closely intermingled with areas of Castaic soils and are mapped in complexes with those soils. The complexes are described under the Castaic series.

Typical profile of a Balcom silty clay loam (0.5 mile north of State Highway 126 along a farm road; about 0.1 mile east of the boundary between Los Angeles and Ventura Counties, in Los Angeles County):

A1--0 to 10 inches, pale-brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; weak, fine, subangular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; common micro and very fine roots and a few fine roots; common micro irregular pores and a few very fine tubular pores; mildly alkaline (pH 7.5); clear, smooth boundary; horizon 6 to 10 inches thick.

C1--10 to 28 inches, pale-brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate, fine, subangular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; common micro and very fine roots and a few fine roots; common micro irregular pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.0); about 10 to 20 percent, by volume, is fragments of light olive-brown (2.5Y 5/4) fine shale; gradual, smooth boundary; horizon 20 to 30 inches thick.

C2--28 inches, light olive-brown (2.5Y 5/4), somewhat weathered and broken shale that is easily cut with a spade; a few fine roots in joints; strongly effervescent.

The A horizon is pale brown, light brown, brown, light yellowish brown, or yellowish brown. It generally has weak, subangular blocky structure, but it is massive in places. The C1 horizon is pale brown, brown, or light yellowish brown. The C2 horizon consists mainly of tilted soft shale and sandstone interbedded with thin yellowish-red layers. It also includes hard sandstone strata in a few places.

Cajon Series

The Cajon series consists of excessively drained soils that have formed on fans in granitic alluvium. Slopes are 0 to 15 percent. The vegetation is mainly annual grasses and forbs and such desert shrubs as Mormon tea, creosotebush, sagebrush, rabbitbrush, and a scattering of Joshua-trees. In a few places such perennial grasses as stipa and Indian ricegrass grow. Elevations range from 2,400 to 2,800 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is about 62° F., and the growing season ranges from 240 to 260 days. Cajon soils are associated with Hesperia and Rosamond soils.

In a typical profile the surface layer is very pale brown loamy sand about 9 inches thick. Below is very pale brown fine sand and sand that contains some fine gravel, generally is calcareous, and extends to a depth of 60 inches. In some places the surface layer is loamy sand, and in some other places the substratum is loam.

These soils are used for irrigated crops, for range in spring, and for recreation.

Cajon loamy sand, 0 to 2 percent slopes (CaA).--This soil is on alluvial fans throughout the general vicinity of Lancaster.

Typical profile (about 0.15 mile north of the intersection of 130th Street East and Palmdale Boulevard, and 50 feet west of the center of the road; SE1/4NE1/4 sec. 26, T. 6 N., R. 10 W.):

A1--0 to 9 inches, very pale brown (10YR 7/3) loamy sand, pale brown (10YR 6/3) moist; massive; slightly hard to soft when dry, very friable when moist, nonsticky and nonplastic when wet; many micro roots and common very fine roots; common micro irregular pores; neutral (pH 7.2); clear, smooth boundary; horizon 8 to 12 inches thick.

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C1--9 to 24 inches, very pale brown (10YR 7/4) fine sand, light yellowish brown (10YR 6/4) moist; weak, thin and medium, platy structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots; a few micro irregular pores; mildly alkaline (pH 7.7); gradual, smooth boundary; horizon 15 to 20 inches thick.

C2--24 to 60 inches, very pale brown (10YR 7/4) sand, light yellowish brown (10YR 6/4) moist; weak, thin and medium, platy structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; slightly effervescent; disseminated lime; moderately alkaline (pH 8.2).

The A1 horizon is light brownish gray, pale brown, very pale brown, or light yellowish brown. It generally is loamy sand, loamy fine sand, or loamy coarse sand in texture, but it is coarse sandy loam in small areas. In most places the areas have a thin overwash of angular granitic gravel on them that resembles desert pavement. The A1 horizon generally is neutral and noneffervescent, though it is mildly alkaline in places. The C1 and C2 horizons are pale-brown, very pale brown, or light yellowish-brown fine sand, sand, and loamy sand. The C2 horizon generally is slightly effervescent and is mildly alkaline to moderately alkaline. Fine gravel occurs throughout the profile but seldom makes up more than 10 percent, by volume. Cajon soils generally are stratified and contain thin lenses of sandy loam, loam, or gravelly loamy coarse sand.

In places along the east and west forks of Anaverde Creek, areas that have a cover of recent overwash are noneffervescent in the upper 36 inches. Also, the soil that has been reworked by wind in areas along 20 Street East and 10 Street East, Avenues K and L, is noneffervescent in the upper half of the profile. In places hummocks of sandy material, 12 to 24 inches high, have been laid down by wind at the base of desert shrubs.

Permeability is rapid in this soil. Available water holding capacity is 4 to 5 inches, fertility is low, and runoff is very slow. The hazard of soil blowing is moderate, and in areas unprotected, the soil blows readily. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Arizo gravelly loamy sand that occupy long, narrow tracts. Also included are small areas of Hesperia loamy fine sand and of Rosamond loamy fine sand. Other included areas, particularly southeast and east of Quartz Hill, contain lenses of strong-brown or reddish-brown light sandy clay loam less than 6 inches thick. These lenses are not continuous and are more common near areas of Adelanto soils than in other places.

Cajon loamy sand, 0 to 2 percent slopes, is used for irrigated crops and as range in spring. Capability unit IIIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Cajon loamy sand, 2 to 9 percent slopes (CaC).--This soil occupies long, broad alluvial fans near Lancaster. Slopes commonly are 2 to 5 percent. In some places cobblestones and other stones are on the upper parts of the fans. Small amounts of soil material have been laid down by wind at the base of most desert shrubs. Runoff is slow. A few deep gullies and many shallow gullies have been cut by intermittent streams. In areas not irrigated hummocks of material deposited by wind cover about 20 percent of the surface.

Included with this soil in mapping are small areas of Arizo gravelly loamy sand. Also included are small areas of Hesperia loamy fine sand and of Hesperia sandy loam.

This Cajon soil is used for irrigated crops and range. Capability unit IIIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Cajon loamy sand, loamy substratum, 0 to 2 percent slopes (CbA).--Light-gray strata of loam are in this soil at a depth below 30 inches, and in a few places as deep as 40 inches. This loamy material is massive, is violently effervescent, and is fairly hard to penetrate with an auger when dry. It varies in thickness, but it generally is about 15 inches thick. In a few places, mainly in areas between 90th and 110th Streets West and D Avenue, this underlying material is dark-brown light clay loam. In areas not irrigated hummocks of material deposited by wind cover about 40 percent of the surface.

Permeability is moderate in this soil because of the underlying loamy material. The available water holding capacity is 5 to 7 inches.

Included with this soil in mapping are areas, 5 to 10 acres in size, that have a surface layer of fine sand. Also included are small areas of Cajon loamy sand, 0 to 2 percent slopes.

This Cajon soil is used for irrigated crops and for range. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Cajon loamy fine sand, 0 to 2 percent slopes, hummocky (CcA2).--Most areas of this soil are west of Lancaster. Hummocks, made up of material deposited by wind, cover more than 90 percent of the total area in a fine pattern. The hummocks are about 2 to 3 feet high and are fairly well stabilized by vegetation. During periods of strong wind, however, some removal and deposition of soil material occurs. Available water holding capacity is 3 to 5 inches. The hazard of soil blowing is high.

Included with this soil in mapping are areas of Dune land as much as 10 or 15 acres in size. Also included are small areas of Hesperia loamy fine sand.

This Cajon soil is used mostly as range in spring. Small acreages have been leveled and irrigated. Capability unit IIIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Cajon loamy fine sand, 9 to 15 percent slopes, hummocky (CcD2).--This soil is on alluvial fans east

of Lancaster near Wilsona. They are on the upper part of foot slopes of the Alpine, Black, Lovejoy, and Piute Buttes. Outcrops of granitic bedrock cover about 2 percent of the surface. Depth to granitic rock is more than 5 feet in 25 percent of the area, and about 4 feet in the remaining 75 percent. In many places the surface layer is fine sand. Soil blowing is active during periods of strong wind. Wind-drifted hummocks as much as 3 feet high cover about 80 percent of the surface. Slopes commonly are 12 to 14 percent, but they are steeper in places. Areas that are not hummocky have a thin layer of overwash on them that consists of granitic gravel. A few areas are cut by deep gullies.

Available water holding capacity is 3.5 to 5.0 inches in this soil. Runoff is slow. The hazard of soil blowing is high.

Included with this soil in mapping are small areas of Cajon loamy fine sand.

This Cajon soil is used as rangeland, as wildlife habitat, and for recreation purposes. Capability unit IIIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Calvista Series

Well-drained soils that formed in material from granitic rock are in the Calvista series. These soils are on uplands. Slopes range from 2 to 30 percent. The vegetation is mainly annual grasses and forbs but includes a scattering of Joshua-trees and creosotebushes and thin stands of Indian ricegrass. Elevations range from 2,900 to 3,100 feet. Average annual precipitation ranges from 4 to 6 inches, average annual temperature is about 63° F., and the growing season ranges from 210 to 240 days. Calvista soils are associated with Hi Vista soils.

Typically the surface layer is pale-brown sandy loam about 7 inches thick. Below is light yellowish-brown sandy loam underlain by hard granitic rock at a depth of about 16 inches.

In wet years these soils are used for occasional grazing in spring. The soils also are used for recreation, and small areas are used for homesites.

Calvista-Hi Vista complex, 2 to 9 percent slopes (ChC).--This complex occupies undulating plains in the northeastern part of the survey area. It is about 60 percent Calvista sandy loam and 40 percent Hi Vista loamy fine sand. The soils occur at random throughout each mapped area, but the Calvista soil occupies the more nearly level areas, and the Hi Vista soil, the rounded ridge tops. A profile of the Hi Vista soil is described under the Hi Vista series. Following is a typical profile of Calvista sandy loam (about 200 feet west of the boundary between San Bernardino and Los Angeles Counties; 0.15 mile north of marker at section corner; SE1/4SE1/4 sec. 24, T. 7 N., R. 8 W.):

A11--0 to 3 inches, pale-brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; weak, fine and medium, subangular blocky structure; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots; many micro irregular pores and common very fine tubular pores; noneffervescent; moderately alkaline (pH 8.0); abrupt, smooth boundary; horizon 3 to 4 inches thick.

A12--3 to 7 inches, pale-brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; slightly hard when dry, friable when moist, slightly sticky and nonplastic when wet; common micro roots; many micro irregular pores and common very fine tubular pores; noneffervescent; moderately alkaline (pH 8.0); clear, smooth boundary; horizon 4 to 6 inches thick.

C--7 to 16 inches, light yellowish-brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro and a few very fine roots; many micro irregular pores and common very fine and fine tubular pores; slightly effervescent; lime in soft masses; moderately alkaline (pH 8.4); clear, smooth boundary; horizon 8 to 10 inches thick.

R--16 inches, hard granitic rock that is slightly weathered in the upper 1/2 inch and has seams of calcite; in some places in the fracture joints in the weathered rock a few, moderately thick, reddish-brown clay films occur in pores and as bridges.

The A1 horizon is pale brown to brown or yellowish brown in color. It ranges from sandy loam to fine sandy loam and loamy fine sand in texture. This horizon contains fine gravel in many places, and in some places it is stony. Structure generally is subangular blocky, but in places the layer is massive. Reaction ranges from mildly alkaline to moderately alkaline. The C horizon is brown to yellowish-brown heavy sandy loam or light sandy loam. Depth varies, but it generally is about 15 to 18 inches. Weathered yellowish-red soil material is in the fracture joints and in the rock fabric.

In the Calvista soil permeability is moderately rapid, available water holding capacity is 1.5 to 2 inches, and fertility is very low. In the Hi Vista soil permeability is moderately slow, available water holding capacity is 4 to 6 inches, and fertility is low. In both soils runoff is slow and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

Included with these soils in mapping are small areas of Adelanto loamy sand and of Cajon loamy sand that generally are in long narrow draws or on alluvial fans. Also included are small patches of Rock land

The soils in this complex are used for occasional grazing in wet years. Large acreages are being subdivided for small homesites. Also, wildflowers are abundant on these soils, and many come to the

areas to see them. Capability unit VIIe-4 (30) dryland; range site 9.

Calvista-Hi Vista rocky complex, 9 to 30 percent slopes (ChE).--This complex is on foothills near Hi Vista. Outcrops of rock cover 5 to 10 percent of the surface. In most places slopes range from 15 to 20 percent. Cobblestones cover as much as 3 percent of the surface, and other stones occur in places. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are some areas, less than 20 acres in size, where sheet and rill erosion are moderate. Also included are a few shallow gullies. Other included areas consist of about 600 acres at the intersection of 190th Street East and Avenue J, where wind has deposited soil material in hummocks.

This complex is used mostly for range. It also is used for such recreational purposes as hiking and the viewing of wildflowers. Capability unit VIIe-4 (30) dryland; range site 9.

Castaic Series

The Castaic series consists of well-drained soils that formed in material from soft shale and sandstone. These soils are on uplands. Slopes range from 2 to 65 percent. The vegetation is mainly annual grasses and forbs, but stipa, a perennial grass, grows in small areas and brush grows in some places on north slopes. Elevations range from 1,250 to 1,500 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is 63° F., and the frost-free season ranges from 275 to 300 days. Castaic soils are associated with Balcom and Saugus soils.

In a typical profile the surface layer is pale-brown silty clay loam about 9 inches thick. Below is yellowish-brown silty clay loam underlain by soft shale and sandstone at a depth of about 26 inches (see pl. I).

These soils are used for dryland small grains and pasture, for range, for watershed, and as wildlife habitat.

Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded (CmF2).--This complex is in the southwestern part of the survey area near Castaic Junction. It is 60 percent Castaic silty clay loam and 40 percent Balcom silty clay loam. A profile typical of the Balcom soil is described under the Balcom series. Following is a typical profile of Castaic silty clay loam on slopes of 30 to 50 percent (0.9 mile west of the junction of San Martinez Road and Vasquez Farm Road; SW1/4SW1/4 sec. 16, T. 4 N., R. 17 W.):

A1--0 to 9 inches, pale-brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; moderate, fine and medium, subangular blocky structure; hard when dry, firm when moist, slightly sticky and plastic when wet; common micro and very fine and a few fine roots; common micro irregular pores and common micro and very fine tubular pores; neutral (pH 6.7); gradual, wavy boundary; horizon 8 to 12 inches thick.

C1--9 to 26 inches, yellowish-brown (10YR 5/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; moderate, medium and coarse, angular blocky structure; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; common micro and a few very fine roots; many micro irregular pores, common very fine tubular pores, and a few micro and fine tubular pores; lower part of horizon is about 10 to 15 percent, by volume, weathered shale fragments; lower 6 inches of horizon is intermittently strongly effervescent; contains disseminated lime; neutral (pH 7.0); gradual, smooth boundary; horizon 17 to 28 inches thick.

C2--26 inches, yellowish-brown (10YR 5/4), somewhat weathered and broken shale that is easily cut with a spade; strongly effervescent; disseminated lime on outside of shale fragments and in fracture joints; layer many feet thick.

The A horizon is pale brown, light brown, brown, light yellowish brown, or yellowish brown. It generally has subangular blocky structure, but it is massive in places. The C1 horizon is pale brown, brown, light yellowish brown, or yellowish brown and is generally neutral. In places, however, the C1 horizon is mildly alkaline and is intermittently calcareous or lacks lime between depths of 10 and 20 inches. The C2 horizon consists of tilted soft shale and sandstone that in a few places contains strata of hard sandstone.

Permeability is moderately slow in these soils. Available water holding capacity is 5 to 7 inches. Fertility is moderate, runoff is rapid, and the hazard of erosion is high. Plant roots generally penetrate to a depth of about 26 to 36 inches, but in places they reach a depth of 40 inches. The Balcom soil, but not the Castaic, contains lime at a depth of 10 to 20 inches.

Included with these soils in mapping are small areas of Gazos clay loam, of Saugus loam, and of Gaviota sandy loam. Also included are narrow areas of soils that have a reddish-brown surface layer.

Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded, are used chiefly for range. They also are used for watershed purposes and for wildlife habitat and recreation. Capability unit VIe-1 (19) dryland; range site 1.

Castaic-Balcom silty clay loams, 9 to 15 percent slopes (CmD).--This complex is on toe slopes in Romero Canyon. Runoff is medium, and the erosion hazard is moderate. In most places slopes range from 12 to 14 percent.

Included with these soils in mapping are a few areas, less than 10 acres in size, where sheet and rill erosion are moderate. Also included are small areas of Saugus loam and Millsholm rocky loam.

This complex is used chiefly for dryland small grains and pasture and for range. Capability unit IIIe-1 (19) irrigated; range site 1.

Castaic-Balcom silty clay loams, 15 to 30 percent slopes (CmE).--The soils in this complex are less sloping and less eroded than Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded, but otherwise they are similar. Slopes commonly are about 25 percent. Runoff is medium to rapid, and the hazard of further erosion is moderate to high. Landslips are common.

Included with this soil in mapping are some areas, 10 to 20 acres in size, where sheet and rill erosion are moderate. Also included are small areas of Saugus loam, of Gazos clay loam, and of Millsholm rocky loam.

This complex is used for range and as wildlife habitat. Capability unit IVe-1 (19) irrigated; range site 1.

Castaic-Balcom silty clay loams, 30 to 50 percent slopes (CmF).--These soils are slightly eroded, and their surface layer is 10 to 12 inches thick.

Included with these soils in mapping are areas 10 to 20 acres in size where rill and sheet erosion are moderate. Also included are small areas of Saugus loam.

Areas of this complex are used for range, wildlife habitat, and watershed. Capability unit VIe-1 (19) dryland; range site 1.

Castaic-Balcom silty clay loams, 50 to 65 percent slopes, eroded (CmG2).--This complex is on mountainous uplands northwest of Castaic Junction, adjacent to the boundary between Los Angeles and Ventura Counties. Moderate sheet and rill erosion have occurred in nearly all places. Many areas are cut by shallow gullies, and a few by deep gullies. Runoff is very rapid, and the hazard of further erosion is very high.

Included with these soils in mapping are areas of Saugus soils.

This complex is used chiefly for wildlife habitat and for watershed purposes, but some areas are grazed. Capability unit VIIe-1 (19) dryland; range site 1.

Castaic silty clay loam, 2 to 9 percent slopes (CkC).--This soil is on toe slopes. Some areas are along Davenport Road and others are near the communities of Vincent and Acton. The surface layer is pinkish gray to dark brown and is 6 to 8 inches thick. The material below is clay loam or silty clay loam and has blocky structure. It is mildly alkaline to moderately alkaline and generally is effervescent. Many fine cracks extend to a depth of about 18 inches in this soil. This soil formed in weathered nonmarine shale along Davenport Road, but in weathered basalt west of Agua Dulce. Depth to the shale or basalt is about 36 to 40 inches in most places, but it is 30 inches in some places and 44 inches in others.

Fertility is low in this soil. Available water holding capacity is 5.0 to 7.5 inches. Roots extend to a depth of 30 to 44 inches. Runoff is slow to medium, and the erosion hazard is slight to moderate.

Included with this soil in mapping are some areas, 5 to 10 acres in size, where sheet and rill erosion are moderate. Other included areas are depressional, are 1 to 5 acres in size, and have a yellowish-red silty clay surface layer. Here cracks are 0.5 to 0.8 inch wide and 10 to 16 inches deep, and the subsoil is finer textured than in other areas of this soil. Small areas of Agua Dulce stony loam, Las Posas loam, and Millsholm rocky loam also are included.

Castaic silty clay loam, 2 to 9 percent slopes, eroded, is used only for limited grazing. Dryland farming has not been successful. A few areas are used as homesites. Capability unit IIIe-1 (19) irrigated; range site 1.

Castaic silty clay loam, 9 to 15 percent slopes (CkD).--On this soil runoff is medium and the erosion hazard is moderate. About 25 percent of the areas are moderately eroded. Included in mapping are small areas of Castaic-Balcom silty clay loams, 9 to 15 percent slopes.

This soil is used for range and as homesites. Capability unit IIIe-1 (19) irrigated; range site 1.

Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded (CnG3).--This undifferentiated group of soils is 35 percent Castaic silty clay loam and 30 percent Saugus loam. Included in mapping this unit are exposed areas of soft shale and conglomerate that make up as much as 10 percent of the unit and areas of Balcom silty clay loam that make up as much as 25 percent. Areas of this unit are cut by many intermittent, very deep drainage channels that have narrow V-shaped valleys and between them sharp, tortuous divides. Soil slipping is common, and geologic erosion is active. During heavy rainstorms much silt is washed from these soils. Because of repeated burning of brush, the vegetation on these soils now consists mainly of thick stands of chamise.

The Castaic soil in this unit is steeper and more eroded than the Castaic soil in Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded, but otherwise it is similar. Also, depth to soft shale generally is less, or 20 to 30 inches. The Saugus soil is steeper and more eroded than Saugus loam, 30 to 50 percent slopes, eroded, but otherwise it is similar. In addition, depth to weakly consolidated sediment is 24 to 44 inches. Slopes are dominantly 45 to 65 percent.

Available water holding capacity is 4.0 to 6.0 inches in the Castaic soil, and 4.0 to 7.0 inches in the Saugus soil. In both soils fertility is very low, runoff is very rapid, and the hazard of further erosion is very high.

Most of this unit is inaccessible to man and livestock because the brush is dense, the soils are steep and very steep, and the valleys are narrow and V-shaped. These soils are used for watershed and for wildlife habitat. Capability unit VIIIe-1 (19, 20, 30) dryland; range site not assigned.

Chino Series

In the Chino series are somewhat poorly drained soils that have formed in mixed alluvium that is dominantly granitic. These soils are in narrow valleys. Slopes range from 0 to 2 percent. The vegetation is mainly saltgrass, sedges, and wire-grass, but wildrye grows in some places. Elevation is about 3,100 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 63° F., and the frost-free season ranges from about 230 to 275 days. Chino soils are associated mainly with Hanford and Greenfield soils.

Typically the surface layer is gray loam about 16 inches thick. Below is gray and light brownish-gray silty clay loam and clay loam that extends to a depth of 60 inches or more and contains many fine mottles. It also contains some black concretions and many salt or gypsum crystals.

These wet (see pl. I) soils are in meadow and are used only for pasture.

Chino loam (Co).--This is the only Chino soil mapped in the Area. It is nearly level and generally is in Leona Valley, but many areas are along the Tehachapi Range in tracts of 5 to 15 acres.

Typical profile (in Leona Valley, 0.15 mile south of schoolhouse on Bouquet Canyon Road, 50 feet west of Amargosa Creek Bridge; NE1/4SE1/4 sec. 17, T. 6 N., R. 13 W.):

A1--0 to 16 inches, gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; massive; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro, very fine, and medium roots; common micro irregular pores and a few very fine tubular pores; many, very fine, rounded worm casts; slightly effervescent; disseminated lime; moderately alkaline (pH 8.2); clear, smooth boundary; horizon 16 to 20 inches thick.

C1--16 to 28 inches, gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) moist; moderate, medium and coarse, subangular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; common micro, very fine, and fine roots; a few very fine and fine tubular pores; strongly effervescent; disseminated lime; strongly alkaline (pH 8.6); gradual, smooth boundary; horizon 10 to 14 inches thick.

C2--28 to 60 inches, light brownish-gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; common, distinct, fine, yellowish-brown (10YR 5/6 moist) mottles and common, medium, distinct, dark-brown (7.5YR 4/4 moist) mottles; massive; hard when dry, friable when moist, sticky and plastic when wet; a few micro roots; a few micro irregular pores and a few fine tubular pores; one side of cut bank shows many gypsum and salt crystals; violently effervescent; disseminated lime; very strongly alkaline (pH 9.2).

The A horizon generally ranges from gray to grayish brown in color, but in places it is very dark gray to nearly black when moist. Texture ranges from loam to light silty clay loam. This horizon is never both hard and massive when dry. The C1 horizon is light gray to gray, grayish brown, or light brownish gray. It is heavy loam, silty clay loam, or clay loam in texture. Mottles range from few to many, from faint to prominent, and from yellowish red to strong brown. In places the C2 horizon is grayish brown or light olive brown, but it generally is light brownish gray. Texture ranges from heavy loam to clay loam. Thin strata of sandy loam are common at a depth below 40 inches.

The content of salt and alkali throughout the profile varies, but the quantity is not large. Depth to the seasonal high water table is between 3 and 4 feet.

Permeability is moderately slow in this soil. Available water holding capacity is 10 to 12 inches. Present fertility is moderate, but when the soil is reclaimed, fertility is high. Runoff is very slow, and the soil is likely to be ponded in places in spring. The hazard of erosion is none to slight. Roots can penetrate to a depth of 60 inches or more, depending upon the height of the fluctuating water table.

Included with this soil in mapping are small areas of Hanford sandy loam, of Mocho loam, and of Sorrento loam. Also included are a few areas in which the surface layer is more than 20 inches thick. In other included areas the surface layer is noncalcareous.

Chino loam is wet and is in meadow. It is used only as pasture. Capability unit IIw-2 (19) irrigated; range site 5.

Cortina Series

The Cortina series consists of excessively drained soils that have formed in alluvium that is predominantly sedimentary. These soils are on alluvial fans. Slopes are 0 to 9 percent. The vegetation is stands of chamise and juniper that have an understory of annual grasses and forbs. Elevations range from 1,200 to 1,400 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 63° F., and the frost-free season ranges from 275 to 300 days. Cortina soils are associated with Metz soils.

In a typical profile the surface layer is pale-brown cobbly sandy loam about 6 inches thick. Below, to a depth of 60 inches or more, is pale-brown and light yellowish-brown very gravelly and

cobbly sandy loam. In some areas the surface layer is not cobbly.

These soils are used for dryland pasture and small grains, for range, and for irrigated crops.

Cortina cobbly sandy loam, 2 to 9 percent slopes (CzC).--This soil is on narrow alluvial fans along Castaic Creek, in Agua Dulce Canyon, and in Mint Canyon.

Typical profile (on the Castaic Creek Canyon Road, about 0.6 mile north of old Cordova Ranchhouse, and 200 yards due east; SW1/4SW1/4 sec. 25, T. 6 N., R. 17 W.):

A1--0 to 6 inches, pale-brown (10YR 6/3) cobbly sandy loam, brown (10YR 5/3) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; many micro and very fine roots and a few fine roots; common micro irregular pores and a few fine tubular pores; 10 percent, by volume, is cobblestones; slightly acid (pH 6.5); clear, smooth boundary; horizon 5 to 22 inches thick.

C1--6 to 22 inches, pale-brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; common micro irregular pores and a few fine tubular pores; about 55 percent, by volume, is large pebbles and 10 percent, by volume, is cobblestones; slightly acid (pH 6.5); gradual, smooth boundary; horizon 14 to 18 inches thick.

C2--22 to 60 inches, light yellowish-brown (10YR 6/4) very cobbly sandy loam, yellowish brown (10YR 5/4) moist; massive; a few micro and very fine roots; a few micro irregular pores and a few very fine tubular pores; about 60 percent, by volume, is cobblestones; neutral (pH 7.0).

Color of the A1 horizon ranges from pale brown to brown or yellowish brown. Texture ranges from sandy loam to fine sandy loam or cobbly sandy loam. Cobblestones occupy from 5 to 15 percent of the surface. Reaction ranges from slightly acid to neutral. The C1 and C2 horizons range from pale brown to light yellowish brown in color. They range from sandy loam to fine sandy loam in texture and are very cobbly or very gravelly. In places the lower part of the C horizon is mildly alkaline.

Permeability is rapid in this Cortina soil. Available water holding capacity is 2 to 3 inches. Runoff is slow, and the hazard of erosion is slight. Fertility is low. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Cortina sandy loam and of Metz loamy sand.

This Cortina soil is used for range, as wildlife habitat, and for watershed purposes. The areas are likely to be flooded for a short period after a heavy rain. Capability unit VIIs-7 (19) dryland; range site 3.

Cortina sandy loam, 0 to 2 percent slopes (CyA).--The surface layer of this soil is 12 to 22 inches thick. It generally is neutral in reaction, but in a few small places it is mildly alkaline. In places along the Santa Clara River and its major tributaries, small areas are subject to variable and unpredictable floods.

Available water holding capacity of this soil is 2.5 to 4.0 inches. Runoff is very slow, and the hazard of erosion is slight.

Included with this soil in mapping are small areas of Cortina cobbly sandy loam and of Metz loamy sand.

This Cortina soil is used for range and for dryland small grains and pasture. It also is used for irrigated alfalfa, small grains, and pasture. Small areas are used for green onions. Capability unit IVs-0 (19) irrigated; range site 3.

Cortina sandy loam, 2 to 9 percent slopes (CyC).--This soil occupies narrow alluvial fans in side canyons along tributaries of the Santa Clara River. The surface layer lacks cobblestones, but the soil otherwise is similar to Cortina cobbly sandy loam, 2 to 9 percent slopes. Thickness of the surface layer ranges from 12 to 16 inches. In most places slopes range from about 3 to 5 percent and are quite long. A few stones and pebbles are in the soil, but they do not interfere with tillage. Runoff is slow, and the hazard of erosion is moderate.

Included with this soil in mapping are small areas of Cortina cobbly sandy loam, of Metz loamy sand, and of Sorrento loam. Also included are small areas that have a surface layer of loam, which are mainly the result of land leveling and smoothing. In the past, loamy soil material from adjacent uplands was moved onto the areas to square fields and eliminate point rows.

This Cortina soil is used for range and for dryland small grains. It also is used for irrigated alfalfa, small grains, and pasture. Capability unit IVs-0 (19) irrigated; range site 3.

Dune Land

Dune land (DuD) consists of poorly graded fine sand that has been piled by wind into rolling hills and ridges. The largest area is on the floor of the valley east of Lancaster. Smaller areas are north of the old Neenach School. The soil material generally is neutral throughout and is intermittently effervescent in the lower part. About 70 percent of the total area is actively shifting. The remaining 30 percent is stabilized by vegetation. The hazard of soil blowing is very high.

This land type is used for recreational purposes and as wildlife habitat. Capability unit VIIIe-4 (20, 30) dryland; range site not assigned.

Gaviota Series

In the Gaviota series are well-drained to somewhat excessively drained soils that formed in material weathered from hard sandstone. These soils

are on uplands. Slopes range from 15 to 50 percent. Annual grasses, forbs, and chamise make up the vegetation. Elevations range from 2,000 to 3,500 feet. Average annual precipitation ranges from about 12 to 16 inches, average annual temperature is 62° F., and the growing season ranges from 250 to 275 days. Gaviota soils are associated with the Gazos and Millsholm soils.

Typically the surface layer is light brownish-gray sandy loam about 10 inches thick, underlain by 4 inches of similar material. Below is hard sandstone. Outcrops of rock cover 2 to 10 percent of the surface.

These soils are used for range, wildlife habitat, and watershed.

Gaviota rocky sandy loam, 15 to 30 percent slopes, eroded (GaE2).--This soil is on uplands in the southwestern and western parts of the survey area. Rock outcrops occupy 2 to 10 percent of the surface.

Typical profile (on Tejon Ranch, 0.5 mile west of the intersection of Highway 138 and the entrance to the headquarters of the old Liebre Ranch, and then 250 yards due north):

A1--0 to 10 inches, light brownish-gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; many very fine, common fine, and a few fine roots; many very fine irregular pores and common very fine tubular pores; slightly acid (pH 6.1); gradual, smooth boundary; horizon 10 to 12 inches thick.

C--10 to 14 inches, light brownish-gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; many micro roots; many micro irregular pores and a few very fine tubular pores; about 10 to 15 percent, by volume, is weathered sandstone; slightly acid (pH 6.1); clear, wavy boundary; horizon 4 to 8 inches thick.

R--14 to 16 inches, hard, coarse-grained sandstone.

The A1 and C horizons are light brownish gray, pale brown, light yellowish brown, or brown in color. Texture ranges from sandy loam to fine sandy loam or near loam. Reaction generally is slightly acid throughout, but in a few places it is neutral. Depth to bedrock generally ranges from 14 to 20 inches.

This soil is well drained. Permeability is moderately rapid. Available water holding capacity is 1.0 to 2.0 inches. Runoff is medium, and the hazard of erosion is moderate. Fertility is low. Roots can penetrate to a depth of 14 to 20 inches.

Included with this soil in mapping are small areas of Gaviota rocky sandy loam, 30 to 50 percent slopes, eroded. Also included are small areas of Millsholm rocky loam.

This Gaviota soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (19) dryland; range site 4.

Gaviota rocky sandy loam, 30 to 50 percent slopes, eroded (GaF2).--This soil is on mountains. Some areas are fairly large and are south of Castaic Junction. Smaller areas are south of Solemint and northeast of Quail Lake. Slopes commonly are about 45 percent. In most places sheet and rill erosion are moderate, and a few areas are cut by deep gullies. Outcrops of rock cover from about 5 to 10 percent of the total area. The dominant vegetation is chamise brush and an understory of annual grasses.

Runoff is rapid on this soil, and the hazard of erosion is high. Drainage is somewhat excessive.

Included with this soil in mapping are small areas of Millsholm rocky loam and of Saugus loam. Also included are about 500 acres of a very rocky Gaviota soil near Vasquez Rocks.

This Gaviota soil is used for range, wildlife, and watershed. Capability unit VIIe-1 (19) dryland; range site 4.

Gazos Series

The Gazos series consists of well-drained soils that formed in material weathered from hard shale. These soils occupy mountainous areas. Slopes range from 30 to 50 percent. The vegetation is grasses and oaks. Elevations range from 2,750 to 3,100 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 63° F., and the frost-free season ranges from about 250 to 275 days. Gazos soils are associated with Balcom, Castaic, Gaviota, and Saugus soils.

A typical profile consists of dark grayish-brown light clay loam about 14 inches thick, underlain by dark-gray clay loam about 10 inches thick. Below is hard shale that is shattered in many places.

These soils are used only for range.

Gazos clay loam, 30 to 50 percent slopes (GbF).--This is the only Gazos soil mapped in the Area. It is on mountains in the southwestern part of the survey area.

Typical profile (in Los Angeles County; 8.3 miles west of Castaic Junction on Highway 126 to Potrero Canyon Road; 0.8 mile south on Salt Creek Road to Palo Solo Mountain Road; then about 2 miles in an easterly direction to wire gate (total 8.0 miles from Highway 126 to wire gate); the pit is on Newhall Land and Farming Company property in the Santa Susana Mountains, 795 feet southeast of wire gate, on Palo Solo Mountain Road, near an oak tree):

A11--0 to 14 inches, dark grayish-brown (10YR 4/2) light clay loam, very dark grayish brown (10YR 3/2) moist; moderate, fine, subangular blocky structure; slightly hard to hard when dry, friable when moist, slightly sticky and slightly plastic when wet;

common micro roots and a few very fine and fine roots; a few micro and very fine irregular pores and a few micro tubular pores; about 3 percent, by volume, is shale fragments; slightly acid (pH 6.5); gradual, smooth boundary; horizon 10 to 14 inches thick.

A12--14 to 24 inches, dark-gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; moderate, fine and medium, subangular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro roots and a few very fine and fine roots; a few micro irregular pores and a few fine tubular pores; about 3 to 5 percent, by volume, is weathered shale; slightly acid (pH 6.5); clear, wavy boundary; horizon 10 to 12 inches thick.

R--24 inches, hard shale that is shattered in many places.

The A1 horizon ranges from dark grayish brown to grayish brown or dark gray when dry, and from very dark grayish brown to very dark brown or very dark gray when moist. Texture ranges from loam to clay loam. Depth to hard shale generally is about 24 inches, but it may be as shallow as 20 inches or as deep as 40 inches. Reaction ranges from slightly acid to neutral. In places an AC or C horizon is present that is as much as 20 inches thick.

Permeability of this soil is moderately slow. Available water holding capacity is 3.0 to 6.0 inches. Runoff is rapid, and the hazard of erosion is high. Fertility is moderate.

Included with this soil in mapping are small areas of Balcom, Castaic, Gaviota, and Saugus soils. Also included are small areas where outcrops of shale occupy 2 percent of the surface.

This Gazos soil is used mostly for grazing. Capability unit VIe-1 (19) dryland; range site 1.

Godde Series

The Godde series consists of well-drained soils that formed in material weathered from hard schist. These soils occupy mountainous areas. Slopes range from 15 to 50 percent. Annual grasses and forbs, flattop buckwheat, and scattered clumps of California juniper make up the vegetation. Elevations range from 4,200 to a little more than 5,000 feet. Average annual precipitation ranges from 16 to 20 inches, average annual temperature is 55° F., and the frost-free season ranges from about 175 to 200 days. Godde soils are associated with Anaverde soils.

A typical profile consists of grayish-brown loam about 16 inches thick, underlain by hard schist.

These soils are used for range, as wildlife habitat, and for recreation and watershed purposes.

Godde rocky loam, 30 to 50 percent slopes (GdF).--This soil occupies mountainous areas on Pelona Ridge and in other areas in Leona Valley. In places outcrops of rock occupy 5 to 10 percent of the area.

Typical profile (on the summit road to the microwave relay station on top of Pelona Ridge; 3.5 miles southeast of the signpost that reads Anaverde Mountain Road and Pelona Mountain; on Ritter Ranch (NW1/4SW1/4 sec. 2, T. 5 N., R. 13 W.):

A1--0 to 16 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate, fine and medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; many micro and very fine roots and common fine and medium roots; many micro irregular pores and common very fine tubular pores; slightly acid (pH 6.5); gradual, wavy boundary; horizon 14 to 20 inches thick.

R--16 to 19 inches, hard, dark-colored schist.

The A horizon generally is grayish brown in color, but it is brown or gray in places. Present in places is a very thin C horizon consisting of loamy sand. The soil is slightly acid to medium acid throughout. Depth to bedrock ranges from 14 to 20 inches. From 5 to 10 percent of the surface area consists of outcrops of rock and patches of shallow soil.

Permeability of this soil is moderate. Available water holding capacity is 2 to 3 inches. Fertility is low. Runoff is rapid, and the hazard of erosion is high.

Included with this soil in mapping is an unnamed soil that is somewhat similar to this soil but is deeper and has a strongly developed subsoil. This unnamed soil has a surface layer of brown loam and a subsoil of reddish-brown clay loam. Schist parent rock is at a depth of about 36 inches. Also included is a soil that is more than 20 inches deep. This included soil occurs mainly along fault scarps north of Amargosa Creek in the eastern end of Leona Valley, where the parent rock was broken by past faulting action. Here slopes range from 55 to 60 percent. Other included areas consist of small tracts of Anaverde loam.

This Godde soil is used for range, as wildlife habitat, and for recreation and watershed purposes. Capability unit VIIe-1 (20) dryland; range site 4.

Godde loam, 15 to 30 percent slopes (GcE).--This soil is on foot slopes on Pelona Ridge. Except that slopes are gentler, smaller areas consist of shallow soil, and less bedrock is exposed, the soil is similar to Godde rocky loam, 30 to 50 percent slopes. Bedrock crops out in about 2 percent of the area. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are small areas of Godde rocky loam and of Anaverde loam.

This Godde soil is used for grazing and as wildlife habitat. Capability unit VIe-1 (20) dryland; range site 4.

Gorman Series

In the Gorman series are well-drained soils that formed in old granitic alluvium. These soils are on uplands. Slopes range from 9 to 50 percent. The vegetation is annual grasses and oaks. Elevations range from 4,000 to about 4,500 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 55° F., and the frost-free season ranges from 210 to 240 days. Gorman soils are associated with Oak Glen and Sheridan soils.

The surface layer typically is dark-gray and dark grayish-brown heavy sandy loam or sandy loam about 43 inches thick. Below is brown light sandy clay loam and sandy clay loam about 35 inches thick. The substratum is pink light sandy clay loam.

These soils are used for dryland small grains and pasture, as range, for wildlife habitat, and for watershed purposes.

Gorman sandy loam, 15 to 30 percent slopes, eroded (GoE2).--This soil is near Quail Lake and Gorman. The dominant slope is about 25 percent.

Typical profile (in Los Angeles County; on the old Kinsey Ranch, southeast of Gorman and not far from old Ridge Route Road; SE1/4NW1/4 sec. 25, T. 8 N., R. 18 W.):

A11--0 to 5 inches, dark-gray (10YR 4/1) heavy sandy loam, black (10YR 2/1) moist; weak, medium, granular structure; slightly hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; many very fine roots; many, very fine, irregular pores and common very fine and a few fine tubular pores; neutral (pH 7.0); gradual, smooth boundary; horizon 4 to 8 inches thick.

A12--5 to 16 inches, dark-gray (10YR 4/1) heavy sandy loam, very dark gray (10YR 3/1) moist; weak, medium, subangular blocky structure; hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; a few very fine and fine roots and a few medium roots; many very fine irregular pores, common very fine and fine tubular pores, and a few medium tubular pores; slightly acid (pH 6.5); gradual, smooth boundary; horizon 8 to 12 inches thick.

A13--16 to 24 inches, dark-gray (10YR 4/1) sandy loam, very dark grayish brown (10YR 3/2) moist; weak, medium, subangular blocky structure; hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; a few very fine and fine roots; many very fine irregular pores, common very fine and fine tubular pores, and a few medium tubular pores; slightly acid (pH 6.5); gradual, wavy boundary; horizon 8 to 10 inches thick.

A3--24 to 43 inches, dark grayish-brown (10YR 4/2) heavy sandy loam, dark brown (10YR 3/3) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few very fine roots; many very fine irregular pores, common very fine and fine tubular pores, and a few medium tubular pores; several, 1/2 inch thick, dark-brown (7.5YR 3/2) layers in lower half of horizon that contain moderately thick clay films as bridges; several krotovinas, 2 inches in diameter, filled with A1 and C material; medium acid (pH 6.0); clear, wavy boundary; horizon 8 to 20 inches thick.

B21t--43 to 54 inches, brown (10YR 5/3) light sandy clay loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, sticky and plastic when wet; a few very fine roots; many very fine irregular pores, common very fine tubular pores, and a few fine and medium tubular pores; continuous thin clay films occur as bridges and in pores; several indistinct color layers similar to those in lower part of A3 horizon and several indistinct krotovinas filled with soil material from the A horizon; medium acid (pH 6.0); gradual, smooth boundary; horizon 10 to 15 inches thick.

B22t--54 to 65 inches, brown (10YR 4/3) sandy clay loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, sticky and plastic when wet; a few very fine roots; many very fine irregular pores, common very fine tubular pores, and a few fine and medium tubular pores; continuous thin clay films occur as bridges and in pores; color layers and krotovinas similar to those in the A3 horizon; medium acid (pH 6.0); gradual, smooth boundary; horizon 10 to 15 inches thick.

B3t--65 to 78 inches, brown (10YR 5/3) light sandy clay loam, dark brown (10YR 4/3) moist; massive; hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; no roots; many very fine irregular pores, common very fine tubular pores, and a few medium tubular pores; a few moderately thick films in tubular pores and many thin clay films occur as bridges; a few, 1 inch thick, discontinuous, indistinct color layers; strongly acid (pH 5.5); gradual, smooth boundary; horizon 5 to 15 inches thick.

C--78 to 84 inches, pink (7.5YR 7/4) light sandy clay loam, light brown (7.5YR 6/4) moist; massive; slightly hard when dry, friable when moist, sticky and plastic when wet; common very fine irregular pores and a few fine tubular pores; continuous thin clay films occur as bridges; strongly acid (pH 5.5).

The A1 horizons are dark gray to dark grayish brown in color, and in places the color approaches grayish brown. Texture is sandy loam or heavy sandy loam near loam. The material generally includes considerable coarse sand, and it therefore feels gritty. Structure is mostly granular or

subangular blocky. The A horizons are slightly acid to neutral. Acidity increases with depth, and the A3 horizon is medium acid. A transitional A3 or B horizon is always present; it ranges from 8 to 20 inches in thickness.

The B2t horizon is brown to dark brown. It ranges from heavy sandy loam to heavy sandy clay loam but generally is sandy clay loam. It is medium acid. The C horizon is light yellowish brown to pink and is strongly acid. In some places this horizon contains many rotten granitic cobblestones and boulders. Near Oso Canyon, somewhat weathered granite is at a depth of 44 to 60 inches.

Permeability is moderately slow, and available water holding capacity is 7.5 to 9.0 inches. Runoff is medium to rapid, erosion hazard is moderate to high, and fertility is high. In most places roots penetrate to a depth of 60 inches or more.

Mapped with this soil are small areas of Gorman sandy loam, 9 to 15 percent slopes, eroded, and also some small areas of Gorman sandy loam, 30 to 50 percent slopes, eroded.

This Gorman soil is used for range, as wildlife habitat, and for watershed. Capability unit VIe-1 (20) dryland; range site 2.

Gorman sandy loam, 9 to 15 percent slopes (GoD).--This soil is on foothills near Quail Lake. In most places slopes range from about 12 to 14 percent. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are some areas, less than 25 acres in size, where sheet and rill erosion are moderate. Also included are small areas that have slopes of 6 to 8 percent.

This Gorman soil is used for dryland small grains and as range. Capability unit IVe-1 (20) dryland; range site 2.

Gorman sandy loam, 9 to 15 percent slopes, eroded (GoD2).--The surface layer of this soil generally is about 30 inches thick. In most places slopes range from 10 to 14 percent. Sheet and rill erosion are moderate in most areas. Shallow gullies are present in many areas, and deep gullies cut a few areas. Runoff is medium, and the hazard of erosion is moderate.

This soil is used for dryland small grains and as range. Capability unit IVe-1 (20) dryland; range site 2.

Gorman sandy loam, 30 to 50 percent slopes, eroded (GoF2).--This soil is in mountainous areas near Gorman. Slopes are dominantly 35 to nearly 50 percent. In much of the area sheet and rill erosion are moderate. The surface layer is 24 to 28 inches thick. A few deep gullies cut the areas. Runoff is rapid, and the hazard of erosion is very high. Included with this soil in mapping are small areas of Gorman sandy loam, 15 to 30 percent slopes, eroded.

This Gorman soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (20) dryland; range site 2.

Greenfield Series

The Greenfield series consists of well-drained soils that have formed in granitic alluvium. These soils are on alluvial fans and terraces. Slopes are 0 to 15 percent. Annual grasses and forbs make up the vegetation. Elevations range from 2,600 to 3,500 feet. Average annual precipitation ranges from 9 to 12 inches, average annual temperature is about 62° F., and the frost-free season ranges from about 220 to 260 days. Greenfield soils are associated with Hanford and Ramona soils.

In a typical profile the surface layer is pale-brown and brown sandy loam about 20 inches thick. The subsoil is brown sandy loam and heavy sandy loam about 40 inches thick. Below is brown coarse sandy loam.

These soils are used for irrigated and dryland crops. They also are used for pasture and for range.

Greenfield sandy loam, 2 to 9 percent slopes (GsC).--This soil is on alluvial fans near Fairmont.

Typical profile (near center of NE1/4NW1/4 sec. 30, T. 7 N., R. 13 W.):

Ap--0 to 5 inches, pale-brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro irregular pores; slightly acid (pH 6.5); abrupt, smooth boundary; horizon 3 to 6 inches thick.

A12--5 to 20 inches, brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro roots; common micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.3); gradual, smooth boundary; horizon 13 to 18 inches thick.

B1--20 to 29 inches, brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, slightly sticky and nonplastic when wet; a few micro roots; a few micro irregular pores, common very fine tubular pores, and a few fine tubular pores; a few thin clay films as bridges; slightly acid (pH 6.3); gradual, smooth boundary; horizon 8 to 12 inches thick.

B2t--29 to 60 inches, brown (10YR 5/3) heavy sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, slightly sticky and nonplastic when wet; a few micro roots; a few micro irregular pores and a few tubular pores; common moderately thick clay films in pores and many moderately thick clay films as bridges; lower half of the horizon has four to six oblique, thin, dark-brown (10YR 4/3) layers that in many places are discontinuous; neutral (pH 7.0); gradual, smooth boundary; horizon 28 to 32 inches thick.

C--60 to 80 inches, brown (10YR 5/3) coarse sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; no roots or pores; neutral (pH 7.2).

The A horizon ranges from pale brown to brown or yellowish brown in color. It has been reworked by wind, and the texture is coarse sandy loam or sandy loam. The content of organic matter is low. The B2t horizon ranges from light yellowish brown to dark yellowish brown or brown in color. It is sandy loam or loam in texture and contains slightly more clay (3 to 5 percent more) than the A or C horizon. Structure is weak subangular blocky, or in places the horizon is massive. The C horizon is stratified in many places with coarse-textured material and is lighter colored than the B horizon in many places. Reaction increases gradually with increasing depth from slightly acid to neutral. Below a depth of 40 inches, the profile is mildly alkaline to moderately alkaline and is effervescent. The thin layers of different colored material in the profile vary greatly in amount, location, and thickness.

Permeability is moderately rapid in this soil. Available water holding capacity is 7.5 to 9.0 inches. Fertility is moderate. Roots can penetrate to a depth of 60 inches or more. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

Included with this soil in mapping are small areas of Hanford coarse sandy loam and of Ramona coarse sandy loam. Also included are some areas, 10 to 20 acres in size, of fine sandy loam, sandy loam, and loamy fine sand that contain patches of fine gravel.

This Greenfield soil is used for irrigated crops and for dryland small grains and pasture and range. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Greenfield sandy loam, 0 to 2 percent slopes (GsA).--This soil is on long, smooth, broad alluvial fans near Fairmont. In places the surface layer is coarse sandy loam. Runoff is very slow, and the hazard of erosion is slight. Cobblestones occupy some areas, but they do not interfere with tillage.

Included with this soil in mapping are small areas that have a layer of material, 3 to 6 inches thick, that was washed onto the areas from higher lying soils. Also included are small tracts of Riverwash and of Sandy alluvial land that occupy long narrow areas in channels of large intermittent drainageways. Other included areas consist of Hanford coarse sandy loam, 0 to 2 percent slopes.

This Greenfield soil is used about the same as Greenfield sandy loam, 2 to 9 percent slopes. Capability unit I-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Greenfield sandy loam, 2 to 9 percent slopes, eroded (GsC2).--The surface layer of this soil is brown and generally is about 16 inches thick. Slopes commonly range from 4 to nearly 7 percent. In most places sheet and rill erosion are moderate. The areas are cut by many shallow gullies and a few deep gullies.

Included with this soil in mapping are small areas of uneroded Greenfield sandy loams. Also included are small areas of Hanford coarse sandy loam.

This Greenfield soil is used about the same as Greenfield sandy loam, 2 to 9 percent slopes. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Greenfield sandy loam, 9 to 15 percent slopes, eroded (GsD2).--This soil occupies narrow fans and terraces near Fairmont. The surface layer generally is about 16 to 18 inches thick. Slopes commonly range from 10 to 14 percent. In most places sheet and rill erosion are moderate. The areas are cut by many shallow gullies and a few deep gullies. Runoff is medium to rapid, and the hazard of further erosion is moderate to high.

Included with this soil in mapping are some severely eroded areas 5 to 10 acres in size. Also included are small areas of Hanford coarse sandy loam and of Hanford gravelly sandy loam. In other included small areas, slopes are as steep as 16 to 18 percent.

This Greenfield soil is used for dryland small grains, dryland pasture, and range. Capability unit IIIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Gullied Land

Gullied land (GuF) is made up of soil areas that recently have been cut by gullies. Most of the original soil material has been washed away and only remnants of the Gorman, Ramona, and Sheridan soils remain. The hazard of further gully erosion is high. During each rainstorm considerable amounts of the remaining soil material are washed into lower lying drainageways.

This land type is not suitable for farming. Measures needed for controlling runoff and controlling further erosion are shaping the gullies, reseeding the areas, planting trees, and constructing dams. Capability unit VIIIe-1 (19, 20, 30) dryland; range site not assigned.

Hanford Series

In the Hanford series are well-drained or somewhat excessively drained soils that have formed in granitic alluvium. These soils are on alluvial fans. Slopes are 2 to 15 percent. The vegetation is mainly annual grasses and forbs, but California junipers are scattered over the areas. Elevations range from 2,600 to 3,500 feet. Average annual precipitation ranges from 9 to 12 inches, average annual temperature is about 62° F., and the frost-free season ranges from about 220 to 260 days. Hanford soils are associated with Greenfield and Ramona soils.

The surface layer in a typical profile is pale-brown coarse sandy loam about 8 inches thick. Below is light yellowish-brown coarse sandy loam and gravelly loamy coarse sand that extends to a depth of 70 inches or more. In some places the surface layer is loamy sand, sandy loam, gravelly sandy loam, or loam.

These soils are used for irrigated crops, for dryland small grains, for range, and for wildlife.

Hanford coarse sandy loam, 0 to 2 percent slopes (HbA).--This soil is on long, smooth, convex alluvial fans near Fairmont.

Typical profile (0.3 mile south of Lancaster Road (Old Highway 138) and 205th Street West; SW1/4SE1/4 sec. 29, T. 8 N., R. 15 W.):

A1--0 to 8 inches, pale-brown (10YR 6/3) coarse sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; many micro and very fine roots and a few fine roots; common micro irregular pores and a few very fine tubular pores; 5 to 8 percent, by volume, is very fine gravel; slightly acid (pH 6.5); horizon 8 to 14 inches thick.

C1--8 to 39 inches, light yellowish-brown (10YR 6/4) coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard to hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro and very fine roots and a few fine and medium roots; common micro irregular pores; about 8 to 10 percent, by volume, is fine gravel; slightly acid (pH 6.5); gradual, smooth boundary; horizon 30 to 34 inches thick.

C2--39 to 70 inches, light yellowish-brown (10YR 6/4) gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; about 25 percent, by volume, is fine gravel; neutral (pH 6.8).

In color the A1 horizon is pale brown, brown, light yellowish brown, or yellowish brown. The C1 horizon generally is light yellowish-brown, brownish-yellow, yellowish-brown, or strong-brown coarse sandy loam or sandy loam. It is slightly acid to neutral. The C2 horizon generally is light yellowish brown, brownish yellow, yellowish brown, or strong brown in color. It ranges from gravelly loamy coarse sand to gravelly coarse sandy loam in texture and generally contains some fine, angular, granitic gravel. The content of gravel, however, is seldom more than 25 percent. The C2 horizon ranges from neutral to mildly alkaline, and in places it is slightly effervescent. In areas where Hanford soils adjoin Greenfield soils, thin layers of different colored material occur at a depth of 36 to 40 inches.

Permeability of this soil is moderately rapid. Available water holding capacity is 5.0 to 7.0 inches. Fertility is low. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Greenfield sandy loam. Also included are long narrow areas of Riverwash and of Sandy alluvial land along large intermittent drainageways.

This Hanford soil is used for irrigated crops, for dryland small grains, and for range. Capability unit IIs-4 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hanford coarse sandy loam, 2 to 9 percent slopes (HbC).--This soil is on broad, smooth alluvial fans near Fairmont and west of Lancaster, along Portal Ridge, and in the upper end of Anaverde Valley and along Amargosa Creek. In most places slopes range from 2 to 5 percent. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

Included with this soil in mapping are small areas of Greenfield sandy loam, of Hanford gravelly sandy loam, and of Ramona coarse sandy loam. Also included are small areas, less than 20 acres in size, where sheet and rill erosion are moderate.

This Hanford soil is used for irrigated crops, for dryland small grains, and for range. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hanford coarse sandy loam, 9 to 15 percent slopes (HbD).--This soil occupies alluvial fans in narrow side canyons along Portal Ridge. Sheet and rill erosion are slight. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight to moderate.

Included with this soil in mapping are small areas where sheet and rill erosion are moderate. Also included are a few areas cut by shallow gullies.

This Hanford soil is used for dryland small grains, for dryland pasture, and for range. Capability unit IIIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hanford loamy sand, 2 to 5 percent slopes, hummocky (HaB2).--This soil is northwest of Neenach. The surface layer is mainly loamy sand, but on the stronger slopes, small areas consist of fine sand. Hummocks formed by wind and that are as much as 36 inches high cover approximately 80 percent of the area.

The hazard of soil blowing is high on this soil. Runoff is slow, and the hazard of water erosion is slight. Available water holding capacity is 4.5 to 5.5 inches.

Included with this soil in mapping are small areas of Dune land. Also included are small areas of Hanford coarse sandy loam and of Hanford sandy loam.

This Hanford soil is used only for range. Capability unit IVec-1 (19) dryland; range site 3.

Hanford sandy loam, 0 to 2 percent slopes (HcA).--This soil occurs throughout the area near Fairmont. It is dominantly sandy loam and fine sandy loam throughout, but otherwise it is similar to Hanford coarse sandy loam, 0 to 2 percent slopes.

Runoff is slow on this soil, and the hazard of erosion is slight. Available water holding capacity is 6.0 to 7.5 inches. Fertility is moderate. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small

areas of Hanford coarse sandy loam and of Greenfield sandy loam.

This Hanford soil is used for irrigated crops, for dryland grains and pasture, and for range. Capability unit IIs-4 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hanford sandy loam, 2 to 9 percent slopes (HcC).--This soil is on alluvial fans near Fairmont. It is dominantly sandy loam and fine sandy loam throughout and has stronger slopes, but it is otherwise similar to Hanford coarse sandy loam, 0 to 2 percent slopes. In most places slopes range from 2 to 6 percent.

Runoff is slow to medium on this soil, and the hazard of erosion is slight to moderate. Available water holding capacity is 6.0 to 7.5 inches. Fertility is moderate.

Included with this soil in mapping are small areas of Greenfield coarse sandy loam and of Hanford coarse sandy loam. Also included are small areas where rill and sheet erosion are moderate. Other included small areas are on fans where slopes range from 10 to 12 percent.

This Hanford soil is used about the same as Hanford coarse sandy loam, 0 to 2 percent slopes. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hanford gravelly sandy loam, 2 to 9 percent slopes (HdC).--This soil is on cone-shaped alluvial fans near Vincent and Acton. Slopes range from 4 to nearly 9 percent in most places, but they are as much as 12 to 16 percent on the upper parts of some fans. Throughout the profile, the amount of gravel ranges from 20 to 35 percent, by volume. In some places a few cobblestones are on the surface.

Drainage is somewhat excessive in this soil. Available water holding capacity is 5.0 to 7.0 inches. Fertility is low.

Included with this soil in mapping are small areas of Hanford coarse sandy loam, 9 to 15 percent slopes. Also included are some areas where the content of gravel ranges from 35 to 65 percent, by volume. These areas make up about 15 to 20 percent of the total area. In sections 25, 26, 35, and 36, R. 15 W., T. 10 N., small areas of gravelly Greenfield soils occur. These included soils are similar to this Hanford soil in permeability and available water holding capacity and are used about the same.

This Hanford soil is used for range and as wildlife habitat. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hanford loam, 0 to 2 percent slopes (HfA).--This soil is on broad alluvial fans near Fairmont. The surface layer is grayish brown or dark grayish brown and the soil is loam throughout, but otherwise it is similar to Hanford coarse sandy loam, 0 to 2 percent slopes.

Permeability of this soil is moderate. Available water holding capacity is 8 to 10 inches. Fertility is moderate.

This soil is used for irrigated crops and for dryland pasture and range. Capability unit I-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hanford Series, Calcareous Variant

These variants from the normal Hanford soils are well drained. They have formed on alluvial fans in calcareous sedimentary alluvium. Slopes range from 2 to 9 percent. The vegetation is mainly annual grasses and forbs, but sagebrush grows in some places. Elevations range from about 2,800 to 3,000 feet. Average annual precipitation ranges from 9 to 12 inches, average annual temperature is 62° F., and the frost-free season is about 220 to 260 days. These variants are associated with the normal Hanford soils.

In a typical profile the surface layer is pale-brown and light brownish-gray sandy loam about 16 inches thick. Below is pale-brown, light brownish-gray, and light-gray, calcareous coarse sandy loam, fine sandy loam, loam, and sandy loam.

These soils are used for dryland small grains.

Hanford sandy loam, calcareous variant, 2 to 9 percent slopes (HeC).--This is the only variant from the normal Hanford series mapped in the Area. It is on alluvial fans in Hungry Valley. Slopes are dominantly about 2 to 4 percent.

Typical profile (50 feet north of the large gully in lower Hungry Valley and 1.25 miles southeast of Kinsey Ranch Race Track; NE1/4NE1/4 sec. 17, R. 18 W., T. 7 N.):

Ap--0 to 4 inches, pale-brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro and very fine roots; common micro irregular pores and a few very fine tubular pores; neutral (pH 6.6); clear, smooth boundary; horizon 4 to 5 inches thick.

A1--4 to 16 inches, light brownish-gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard when dry, very friable when moist, nonsticky and slightly plastic when wet; many micro and very fine roots; common micro irregular pores and a few very fine and fine tubular pores; slightly effervescent; disseminated lime; mildly alkaline (pH 7.5); gradual, wavy boundary; horizon 10 to 12 inches thick.

C1--16 to 28 inches, pale-brown (10YR 6/3) coarse sandy loam, brown (10YR 5/3) moist; massive; slightly hard when dry, very friable when moist, nonsticky and slightly plastic when wet; many micro roots and a few very fine and fine roots; many micro irregular pores and a very few very fine tubular pores; 3 to 5 percent, by volume, is fine rounded granitic gravel; strongly effervescent; disseminated lime; mildly alkaline (pH 7.5); clear, smooth boundary; horizon 10 to 12 inches thick.

C2--28 to 36 inches, light brownish-gray (10YR 6/2) fine sandy loam, grayish brown (10YR 5/2) moist; massive; hard when dry, friable when moist, nonsticky and slightly plastic when wet; common micro roots; common micro irregular pores and a few very fine tubular pores; one to three discontinuous, oblique, dark-brown (7.5YR 4/4) layers 1/16 to 1/8 inch thick; discontinuous, nearly parallel, very dark gray (10YR 3/1) buried A1 horizon 1/16 inch thick; strongly effervescent; disseminated lime; mildly alkaline (pH 7.5); clear, smooth boundary; horizon 8 to 10 inches thick.

C3--36 to 56 inches, light brownish-gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro roots; common micro irregular pores and a few very fine tubular pores; one root channel lined with continuous thick clay films; one or two continuous, parallel, very dark gray (10YR 3/1) buried A1 horizons about 1/8 to 1/4 inch thick; strongly effervescent; disseminated lime; mildly alkaline (pH 7.5); clear, smooth boundary; horizon 18 to 20 inches thick.

C4--56 to 80 inches, light-gray (10YR 7/2) sandy loam, light brownish gray (10YR 6/2) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; a few micro roots; many micro irregular pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.4).

The A horizons range from pale brown to light brownish gray or light yellowish brown in color and from neutral to mildly alkaline in reaction. In small areas gravel is on the surface. The Ap horizon generally is noneffervescent, but it is effervescent in places.

In color the C horizons range from pale brown to light brownish gray or light gray. Texture ranges from coarse sandy loam to fine sandy loam. Reaction is mildly alkaline to moderately alkaline, and the horizons are slightly effervescent to strongly effervescent. The lower C horizons contain very dark gray buried A1 horizons.

Permeability is moderately rapid in this soil. Available water holding capacity is 7.5 to 9.9 inches. Fertility is moderate. Runoff is slow, and the hazard of erosion is slight.

Included with this soil in mapping are small areas of Hanford sandy loam. Also included are small areas, along the upper edges of alluvial fans, where slopes are as steep as 10 to 12 percent; these areas make up about 10 percent of the total area.

Hanford sandy loam, calcareous variant, 2 to 9 percent slopes, is used for dryland small grains and range. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Hesperia Series

Hesperia soils are well drained and have formed in granitic alluvium. They are on alluvial fans. Slopes are 0 to 5 percent. The vegetation is mainly annual grasses and forbs, but rabbitbrush, sagebrush, and Joshua-trees grow in some areas. Elevations range from 2,400 to about 2,900 feet. Average annual precipitation is 4 to 9 inches, average annual temperature is about 62° F., and the frost-free season ranges from 240 to 260 days. Hesperia soils are associated with Cajon and Rosamond soils.

In a typical profile the surface layer is pale-brown fine sandy loam about 4 inches thick. Below is pale-brown fine sandy loam and sandy loam that extends to a depth of 54 inches or more. In some places the surface layer is loamy fine sand, and in other places it is loam. The substratum is loamy in some areas.

These soils are used for irrigated crops and as range in spring.

Hesperia fine sandy loam, 2 to 5 percent slopes (HkB).--This soil is on long, smooth alluvial fans near Littlerock, Pearblossom, and Lancaster.

Typical profile (near center NE1/4SE1/4 sec. 8, T. 5 N., R. 10 W.):

Ap--0 to 4 inches, pale-brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; weak, medium, subangular blocky structure; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common very fine irregular pores and a few very fine tubular pores; slightly acid (pH 6.3); abrupt, smooth boundary; horizon 4 to 14 inches thick.

C1--4 to 22 inches, pale-brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro and very fine roots and a few fine roots; common micro and very fine irregular pores and a few very fine tubular pores; mildly alkaline (pH 7.5); gradual, smooth boundary; horizon 16 to 20 inches thick.

C2--22 to 54 inches, pale-brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few fine roots; common micro and very fine irregular pores and a few very fine tubular pores; slightly effervescent; disseminated lime; moderately alkaline (pH 8.0); gradual, smooth boundary; horizon 30 to 34 inches thick.

C3--54 to 77 inches, pale-brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few fine roots; common micro and very fine irregular pores and a few very fine tubular pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.0).

The Ap horizon is brown, light brownish gray, or pale brown in color. It has subangular blocky

structure or is massive. Reaction is slightly acid to mildly alkaline. The C horizon is fine sandy loam and sandy loam. It is slightly effervescent to strongly effervescent.

Permeability is moderately rapid in this soil. Available water holding capacity is 7.5 to 8.5 inches. Fertility is moderate. Runoff is slow. The hazard of water erosion is slight to moderate, and the hazard of soil blowing is moderate. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Adelanto loamy sand, of Cajon loamy sand, and of Rosamond loamy fine sand. Also included are soils that have a few thin clay films as bridges. These clay films suggest a weak B horizon, which may occur high in the profile or may be buried at any depth.

This Hesperia soil is used for alfalfa and small grains and as range in spring. Capability unit IIe-1 (30) irrigated, VIIe-1 (30) dryland; range site 7.

Hesperia fine sandy loam, 0 to 2 percent slopes (HkA).--This soil is near Lancaster. Slopes generally are less than 1 percent. Runoff is very slow, and the hazard of water erosion is slight.

Included with this soil in mapping, and making up about 3 percent of the total area, are small areas that are slightly saline to moderately saline. These saline areas have never been irrigated and are still in such vegetation as saltbush and rabbitbrush. Also included are small areas of Cajon loamy sand, of Hesperia loamy fine sand, of Rosamond loamy fine sand, and of Tray sandy loam, saline-alkali.

This Hesperia soil is used for irrigated crops and as range. Capability unit IIe-4 (30) irrigated, VIIe-1 (30) dryland; range site 7.

Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes (HmA).--This soil is near Lancaster. It is less sloping and contains strata of loam or light clay loam at a depth of 35 to 60 inches, but it is otherwise similar to Hesperia fine sandy loam, 2 to 5 percent slopes. The loam or light clay loam horizon ranges from 20 to 30 inches in thickness.

Permeability is moderate in this soil. Available water holding capacity is 8.0 to 9.5 inches. Runoff is very slow, and the hazard of water erosion is slight.

Included in mapping are small areas of Hesperia sandy loam and of Rosamond loamy fine sand.

This Hesperia soil is used about the same as Hesperia fine sandy loam, 2 to 5 percent slopes. Capability unit IIe-1 (30) irrigated, VIIe-1 (30) dryland; range site 7.

Hesperia loamy fine sand, 0 to 2 percent slopes (HgA).--This soil is near Lancaster. It is less sloping and the surface layer consists of 8 to 10 inches of loamy fine sand, but otherwise this soil is similar to Hesperia fine sandy loam, 2 to 5 percent slopes. Slopes generally are less than 1 percent.

The hazard of soil blowing (see pl. I) is moderate on this soil. Available water holding capacity is 6.5 to 7.5 inches. Runoff is very slow.

Included with this soil in mapping are small areas that have hummocks of material deposited on them by wind. Also included are small areas of Hesperia sandy loam. Other included small areas consist of soil that is slightly saline and has never been irrigated.

This Hesperia soil is used about the same as Hesperia fine sandy loam, 2 to 5 percent slopes. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky (HgA2).--This soil is east of Lancaster. Hummocks of material deposited by wind cover about 80 percent of the area. The hummocks range from 2 to nearly 3 feet in height. Except that the surface layer is loamy fine sand, this soil is similar to Hesperia fine sandy loam, 2 to 5 percent slopes.

The hazard of soil blowing is high on this soil. Available water holding capacity is 6.0 to 7.5 inches. Fertility is low. Runoff is very slow.

Included with this soil in mapping are small areas of Dune land. Also included are small areas of soils that have a surface layer of fine sand or of sandy loam.

This Hesperia soil is used only as range in spring. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Hesperia loamy fine sand, 2 to 5 percent slopes (HgB).--This soil is on long, smooth, convex alluvial fans east of Pearblossom. The surface layer is loamy fine sand, but the soil otherwise is similar to Hesperia fine sandy loam, 2 to 5 percent slopes. Slopes generally range from 2 to 3 percent.

The hazard of soil blowing is moderate on this soil. Runoff is very slow. Available water holding capacity is 6.5 to 7.5 inches.

Included with this soil in mapping are small areas of Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky. Also included are small areas of Hesperia fine sandy loam.

This Hesperia soil is used about the same as Hesperia fine sandy loam, 2 to 5 percent slopes. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Hesperia loam, 0 to 2 percent slopes (HnA).--This soil occupies fairly large areas west of Willow Springs in sections 20, 21, 29, and 28, T. 9 N., R. 14 W. The surface layer is an overwash consisting of loam or very fine sandy loam 5 to 14 inches thick. It is very micaceous, is slightly effervescent, and is moderately alkaline. Structure generally is moderate, very thin, platy. The overwash was derived from weathered schist.

Runoff is very slow on this soil, and the hazard of erosion is slight. Available water holding capacity is 8.0 to 9.0 inches.

Included with this soil in mapping are small areas of pale-brown Hesperia loam. These areas are scattered east of Lancaster, near Roosevelt and

farther south to Littlerock. Also included are small areas of Hesperia fine sandy loam. Other included small areas consist of slightly saline soils near Black Butte.

This Hesperia soil is used about the same as Hesperia fine sandy loam, 2 to 5 percent slopes. Capability unit I-1 (30) irrigated, VIIc-1 (30) dryland; range site 7.

Hi Vista Series

In the Hi Vista series are well-drained soils that formed in material from granitic rock. These soils are on upland plains in the northeastern part of the survey area. Slopes range from 2 to 30 percent. The vegetation is chiefly annual grasses and forbs, but Joshua-trees, creosotebushes, and remnant stands of Indian ricegrass are scattered over the areas. Elevations range from 2,900 to 3,100 feet. Average annual precipitation ranges from 4 to 6 inches, average annual temperature is about 63° F., and the growing season ranges from about 210 to 240 days. Hi Vista soils are associated with Calvista soils.

The surface layer in a typical profile is light yellowish-brown loamy fine sand about 6 inches thick. The subsoil is brown, reddish-brown, or yellowish-red light clay loam, sandy clay loam, and gravelly light sandy clay loam about 23 inches thick. Hard granitic rock is at a depth of about 29 inches.

These soils have moderately slow permeability. Available water holding capacity is 4 to 6 inches. Fertility is low.

Hi Vista soils are used only in wet years for occasional grazing in spring. They also are used for recreational purposes, and small tracts are used for homesites. In this survey area Hi Vista soils are closely intermingled with areas of Calvista soils and are mapped only in complexes with those soils. The complexes are described under the Calvista series.

Typical profile of a Hi Vista loamy fine sand (125 feet west of the middle of the road at the intersection of Avenue I and 200th Street East; NE1/4 of NW1/4 sec. 12, T. 7 N., R. 9 W.):

A1--0 to 6 inches, light yellowish-brown (10YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro and very fine roots; common micro irregular pores; neutral (pH 7.2); clear, wavy boundary; horizon 6 to 9 inches thick.

B21t--6 to 11 inches, brown (7.5YR 5/4) light clay loam, dark brown (7.5YR 4/4) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; many thin clay films in pores and as bridges; slightly effervescent; disseminated lime; mildly alkaline (pH 7.5); clear, wavy boundary; horizon 5 to 6 inches thick.

B22t--11 to 21 inches, reddish-brown (5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; moderate, fine and medium, angular blocky structure; hard when dry, firm when moist, and sticky and plastic when wet; a few micro and very fine roots; many micro irregular pores and a few very fine tubular pores; a few moderately thick clay films on ped faces; many moderately thick clay films in pores and as bridges; about 10 to 15 percent, by volume, is fine gravel; slightly effervescent; disseminated lime; mildly alkaline (pH 7.5); gradual, wavy boundary; horizon 8 to 12 inches thick.

B3t--21 to 29 inches, yellowish-red (5YR 5/6) gravelly light sandy clay loam, yellowish red (5YR 4/6) moist; massive; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro and very fine roots; many micro irregular pores, common micro tubular pores, and a few very fine tubular pores; many moderately thick clay films in pores and as bridges; about 30 to 40 percent, by volume, is fine gravel; slightly effervescent; disseminated lime; moderately alkaline (pH 8.0); gradual, wavy boundary; horizon 6 to 9 inches thick.

R--29 inches, hard granitic parent rock.

In many places overwash of granitic gravel covers the surface. The B2t horizon generally is brown or reddish brown in color, but in places the color is strong brown. Texture ranges from sandy clay loam to light clay loam. Structure is angular blocky or the horizon is massive. Fine gravel makes up about 5 to 15 percent, by volume, of the B2t horizon and about 20 to 40 percent, by volume, of the B3t horizon. Depth to granitic parent rock ranges from 25 to 36 inches, and roots can penetrate to this depth. The parent rock is acid igneous crystalline rock that contains many thick calcite seams.

Las Posas Series

Moderately deep, well-drained soils that formed in material weathered from tuff and basalt are in the Las Posas series. These soils are on uplands. Slopes range from 9 to 50 percent. The vegetation consists of stands of chamise, candlestick yucca, and California juniper that have an understory of annual grasses and forbs. Elevations range from 2,600 to 3,500 feet. Average annual precipitation ranges from about 9 to 12 inches, average annual temperature is about 62° F., and the growing season ranges from about 240 to 275 days. Las Posas soils are associated with Agua Dulce and Castaic soils.

In a typical profile the surface layer is dark-brown loam about 3 inches thick. The subsoil is dark-brown and reddish-brown clay loam and heavy clay loam about 21 inches thick. Hard basalt is at a depth of about 24 inches.

These soils are used for range and as wildlife habitat.

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Las Posas-Toomes rocky loams, 30 to 50 percent slopes (LdF).--Some areas of this unit are on steep mountains, and other areas are on moderately steep foothills (see pl. II). The areas are near Acton, Agua Dulce, and Vincent. In most places the complex is about 65 percent Las Posas rocky loam and about 30 percent Toomes rocky loam. Where slopes are chiefly 30 to 35 percent, the proportion of Toomes soil is greater. Here Las Posas soils make up about 55 percent of the area, and Toomes soils, 40 percent. Included with these soils in mapping, and making up about 5 percent of the areas, are tracts of Castaic silty clay loam that are 2 to 4 acres in size.

Typical profile (see pl. II) of Las Posas rocky loam (in Los Angeles County; 0.15 mile west of Sierra Highway along unimproved road; SW1/4NW1/4 sec. 11, T. 5 N., R. 11 W.):

A1--0 to 3 inches, dark-brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate, very fine, granular structure; soft when dry, very friable when moist, slightly sticky and plastic when wet; common micro roots; many micro irregular pores and a few very fine tubular pores; 5 to nearly 15 percent, by volume, is gravel and 2 to 5 percent is cobblestones; neutral (pH 7.0); clear, wavy boundary; horizon 3 to 6 inches thick.

B1t--3 to 7 inches, dark-brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate, medium, subangular blocky structure; hard when dry, friable when moist, sticky and plastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; a few thin clay films on ped faces and common thin clay films as bridges between mineral grains; krotovina 1-1/2 inches thick filled with soil material from the A1 horizon; neutral (pH 7.0); clear, smooth boundary; horizon 4 to 6 inches thick.

B2t--7 to 24 inches, reddish-brown (5YR 4/3) heavy clay loam, reddish brown (5YR 4/4) moist; strong, coarse, angular blocky structure; very hard when dry, friable when moist, sticky and plastic when wet; a few micro and very fine roots between peds; a few micro irregular pores and a few very fine tubular pores; many moderately thick clay films on ped faces and common thin clay films in pores; about 5 percent, by volume, is fine gravel; neutral (pH 7.2); clear, wavy boundary; horizon 17 to 20 inches thick.

R--24 to 36 inches, hard, dark-colored basalt.

The A horizon ranges from brown to dark brown or reddish brown in color. Texture ranges from loam to light clay loam, and reaction is slightly acid to neutral. By volume, gravel makes up from 5 to nearly 15 percent of the A horizon, and cobblestones, from 2 to 5 percent. Outcrops of basalt and tuff cover about 5 to 10 percent of the surface. In color the Bt horizon ranges from reddish brown to dark brown, and in a few places to yellowish red. Texture ranges from heavy clay loam to clay, and reaction, from neutral to mildly alkaline. In places where tuff is the parent rock, the soils are brown, but where basalt is the parent rock, the soils are dark reddish brown. Depth to which roots can penetrate ranges from 24 to 32 inches, and the depth varies within a short distance. Fragments of weathered tuff and basalt in the material below the A horizon range from 5 to 10 percent. Unlike Las Posas soils mapped in other areas, hue of the reddish-brown part of the subsoil is 5YR.

Permeability is moderately slow. Runoff is rapid, and the hazard of erosion is high. Available water holding capacity is 4.0 to 7.0 inches. Fertility is low.

This complex is used for range and as wildlife habitat. Capability unit VIIe-1 (19) dryland; range site 2.

Las Posas loam, 9 to 30 percent slopes (LaE).--This soil occupies toe slopes and foothills west of Agua Dulce. Slopes are fairly long and smooth. This soil is less sloping and rocks crop out on less than 2 percent of the areas, but the profile otherwise is like the one described as typical of Las Posas rocky loam in the mapping unit Las Posas-Toomes rocky loams, 30 to 50 percent slopes. Cobblestones occupy as much as 5 percent of the surface.

Runoff is medium to rapid on this soil. The hazard of erosion is moderate to high. Available water holding capacity is 4.0 to 7.0 inches.

Included with this soil in mapping are small areas of Las Posas-Toomes rocky loams, 30 to 50 percent slopes.

This soil is used for range in spring. Capability unit IVe-1 (19) irrigated; range site 2.

Lebec Series

The Lebec series consists of well-drained soils that formed in material weathered from limestone. These soils are in mountainous areas. Slopes range from 15 to 50 percent. Annual grasses and forbs and clumps of California juniper make up the vegetation. Elevations range from 4,000 to 5,500 feet. Average annual precipitation ranges from about 12 to 16 inches, average annual temperature is 55° F., and the growing season ranges from 180 to 210 days. Lebec soils are associated with Sheridan soils.

In a typical profile the surface layer is brown and dark-brown loam about 21 inches thick. Below is dark-brown gravelly heavy loam about 18 inches thick. Limestone parent rock is at a depth of about 39 inches.

These soils are used for range, wildlife habitat, and watershed.

Lebec rocky loam, 15 to 50 percent slopes (LeF).--This is the only Lebec soil mapped in the Area. It is on uplands near Cottonwood Canyon northeast of Gorman.

Typical profile (on Tejon Ranch in Kern County; 0.1 mile northwest and 200 yards due north uphill

from large cottonwood tree near Cottonwood Canyon, off cattle access road):

A11--0 to 12 inches, brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; strong, medium and coarse, subangular blocky structure; slightly hard when dry, firm when moist, nonsticky and slightly plastic when wet; common micro roots and a few very fine and fine roots; common micro irregular pores and a few very fine tubular pores; violently effervescent; disseminated lime; moderately alkaline (pH 8.2); clear, smooth boundary; horizon 10 to 16 inches thick.

A12--12 to 21 inches, dark-brown (10YR 4/3) heavy loam, dark brown (10YR 3/3) moist; moderate, medium, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro roots and a few fine roots; many micro irregular pores and a few very fine tubular pores; many, fine, irregularly shaped filaments and threads of segregated lime; violently effervescent; disseminated lime; moderately alkaline (pH 8.4); gradual, smooth boundary; horizon 8 to 12 inches thick.

C--21 to 39 inches, dark-brown (10YR 4/3) gravelly heavy loam, dark brown (10YR 3/3) moist; massive; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; common micro irregular pores and a few very fine tubular pores; strongly effervescent; disseminated lime; about 30 percent, by volume, is soft strongly weathered limestone fragments; moderately alkaline (pH 8.4); gradual, smooth boundary; horizon 16 to 20 inches thick.

R--39 inches, hard limestone parent rock.

The A horizon is brown, dark brown, or grayish brown in color. Structure ranges from strong, medium, subangular blocky to medium or coarse granular. The content of organic matter is 2 to 3 percent in the upper 10 inches, but it decreases to less than 1 percent at a depth of 20 inches. Outcrops of bedrock cover 5 to 10 percent of the surface. The C horizon is loam or heavy loam and typically is dark brown or strong brown. Just above the parent rock, weathered gravelly fragments make up 15 to 35 percent of the horizon. Throughout the profile the soil is strongly effervescent and contains disseminated lime. In places segregated lime occurs as soft masses in seams and as filaments or threads. Depth to which roots can penetrate ranges from 34 to 48 inches, but in most places roots reach to a depth of 39 inches.

This soil is moderately permeable. Available water holding capacity is 4 to 7 inches, depending upon depth. Fertility is moderate. Runoff is medium to rapid, and the hazard of erosion is moderate to high.

Included with this soil in mapping are small areas of Sheridan sandy loam. Also included are small areas of soils that have a gravelly or cobbly surface layer.

This Lebec soil is used for range, wildlife habitat, and watershed. The limestone is suitable for use in cement. Capability unit VIe-1 (20) dryland; range site 2.

Merrill Series

In the Merrill series are moderately well drained soils that have formed in granitic alluvium. These soils are on basin rims. Slopes are 0 to 2 percent. The vegetation is mainly saltbush, rabbitbrush, and saltgrass, but sagebrush grows in some areas. The understory is annual grasses and forbs. Elevation is about 2,400 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is 62° F., and the frost-free season ranges from 240 to 260 days. Merrill soils are associated with Pond, Sunrise, and Tray soils.

Typically the surface layer is brown and dark-gray loam and sandy loam about 10 inches thick. Below is pale-brown clay loam about 15 inches thick underlain by white and very pale brown, weakly cemented loam.

These soils are used for grazing in spring and for poultry farms.

Merrill sandy loam (Me).--This is the only Merrill soil mapped in the Area. It is nearly level and is on basin rims in areas west of 60th Street West and Avenue J.

Typical profile (150 feet north and 0.25 miles east of southwest corner of sec. 16, T. 7 N., R. 13 W.):

A11--0 to 1 1/2 inches, brown (10YR 5/3) loam overwash, dark brown (10YR 3/3) moist; 0 to 1/2 inch has strong, thin, platy structure and 1/2 to 1 1/2 inches has moderate, medium, granular structure; slightly hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; a few very fine roots; many very fine irregular pores and a few very fine tubular pores; slightly effervescent; disseminated lime; moderately alkaline (pH 8.2); abrupt, smooth boundary; horizon 0 to 5 inches thick.

A12--1 1/2 to 10 inches, dark-gray (10YR 4/1) sandy loam, very dark grayish brown (10YR 2/2) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; a few very fine and fine roots and common medium roots; many very fine irregular pores; violently effervescent; moderately alkaline (pH 8.2); clear, smooth boundary; horizon 8 to 14 inches thick.

IIC1--10 to 16 inches, pale-brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate, fine and medium, angular blocky structure; hard when dry, very friable when moist, sticky and plastic when wet; a few very fine

and fine roots and common medium roots; many very fine irregular pores and common very fine and fine tubular pores; a few thin clay films on some ped faces; 1/3 of the horizon is made up of krotovinas that are brown (10YR 5/3), dark grayish brown (10YR 4/2) moist, and have moderate, fine, granular structure; strongly effervescent; moderately alkaline (pH 8.2); gradual, smooth boundary; horizon 6 to 8 inches thick.

IIC2--16 to 25 inches, pale-brown (10YR 6/3) light clay loam, brown (10YR 5/3) moist; weak, medium, angular blocky structure; a few very fine and fine roots; 15 percent is krotovinas that are brown (10YR 5/3), dark grayish brown (10YR 4/2) moist, and have moderate, fine, granular structure; clear, smooth boundary; horizon 9 to 18 inches thick.

IIIC3ca--25 to 29 inches, white (10YR 8/2) weakly cemented loam, pale brown (10YR 6/3) moist; strong, medium and thick, platy structure; very hard when dry, very firm when moist, nonsticky and nonplastic when wet; a few fine roots; a few very fine irregular pores, common very fine tubular pores, and a few fine tubular pores; top of horizon is not glazed; violently effervescent; strongly alkaline (pH 8.8); clear, smooth boundary; horizon 4 to 10 inches thick.

IIIC4ca--29 to 39 inches, very pale brown (10YR 7/3) weakly cemented loam, pale brown (10YR 6/3) moist; strong, fine, angular blocky structure (the peds appear to be fine lime concretions); hard when dry, very firm when moist, nonsticky and nonplastic when wet; a few very fine and fine roots; many very fine irregular pores, a few very fine and fine tubular pores, and common medium tubular pores; violently effervescent; strongly alkaline (pH 8.8); gradual, smooth boundary; horizon 6 to 12 inches thick.

IIIC5ca--39 to 58 inches, white (10YR 8/2) weakly cemented loam, very pale brown (10YR 7/3) moist; weak, fine, subangular blocky structure; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; a few very fine and fine roots; many very fine irregular pores, common very fine tubular pores, and a few fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); horizon is 50 percent hard to very hard lime concretions; in the upper 1 to 3 inches concretions are irregularly rounded and joined, and the ones below are mostly plates; many very fine to fine tubular pores in hard concretions, and a few pores in very hard concretions; concretions increase in number with depth; some pale-brown earthy stains.

In color the A horizon ranges from gray to very dark grayish brown or grayish brown, but it commonly is dark gray, dark grayish brown, or brown. Texture ranges from sandy loam to loam, but it is sandy loam in most places. Overwash strata are common. The Cca horizon is white or pale brown and is loam or clay loam in texture. In places the individual plates or concretions are extremely hard, but the major part of the Cca horizon can be otherwise augered with medium difficulty. Depth to which plant roots and water can penetrate ranges from about 23 to 40 inches. The soil is nonsaline to slightly saline or moderately saline. It is never strongly saline. The content of alkali in the upper horizons is no more than slight.

Permeability is moderately slow in this soil. Available water holding capacity is 4 to 6 inches. Fertility is low. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. Included in mapping are small areas of Sunrise sandy loam.

Merrill sandy loam is used for range in spring and for poultry farms. Capability unit IIIe-8 (30) irrigated, VIIe-1 (30) dryland; range site 6.

Metz Series

The Metz series consists of somewhat excessively drained soils that have formed in mixed alluvium. These soils are on alluvial fans and flood plains. Slopes are 0 to 9 percent. The vegetation is mainly grasses and oaks. Elevations range from 1,175 to 1,250 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is 63° F., and the frost-free season ranges from 275 to 300 days. Metz soils are associated with Cortina. Sorrento, and Yolo soils.

In a typical profile the surface layer is brown loamy sand about 7 inches thick. Below is brown and light brownish-gray loamy sand and sand that contains some fine gravel and extends to a depth of 60 inches or more. In some areas the surface layer is loam.

These soils are used for irrigated crops, dryland farming, and wildlife habitat.

Metz loamy sand, 0 to 2 percent slopes (MfA).--This soil is on alluvial fans near Castaic Junction.

Typical profile (about 0.1 mile south of State Highway 126 on the Humble Refinery Road, and 3.2 miles west of Castaic Junction):

Ap--0 to 7 inches, brown (10YR 5/3) loamy sand, dark brown (10YR 4/3) moist; weak, fine and medium, subangular blocky structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; many micro irregular pores; about 5 percent, by volume, is gravel; neutral (pH 7.0); clear, smooth boundary; horizon 7 to 16 inches thick.

C1--7 to 38 inches, brown (10YR 5/3) loamy sand, dark brown (10YR 4/3) moist; single grain; loose when dry and moist, nonsticky and nonplastic when wet; common micro roots; common micro irregular pores; about 7 to 12 percent by volume, is fine gravel; neutral (pH 7.2); gradual, smooth boundary; horizon 30 to 34 inches thick.

C2--38 to 60 inches, light brownish-gray (10YR 6/2) sand, grayish brown (10YR 5/2) moist; single grain; loose when dry and moist, nonsticky and nonplastic when wet; a few micro roots; two or three discontinuous lenses of loamy fine sand, 1/2 to 1 inch thick, in lower part of horizon; about 10 percent, by volume, is gravel; neutral (pH 6.6); boundary undetermined.

The Ap horizon ranges from brown to light brownish gray or grayish brown in color. A few pebbles and cobblestones are present, but their numbers are not enough to interfere with tillage. The C1 and C2 horizons characteristically are brown or light brownish-gray loamy sand or sand. In many places thin strata of sandy loam, loam, or gravelly sand are at a depth below 40 inches. Reaction typically is neutral to mildly alkaline. In places the lower part of the C2 horizon is calcareous. Throughout the profile, the content of fine gravel ranges from 5 to 12 percent, by volume.

Unlike Metz soils mapped in other parts of California, the layers below the A horizon in Metz soils mapped in this survey area are sandy throughout.

Permeability of this soil is rapid. Available water holding capacity is 4 to 5 inches. Fertility is low. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight to moderate. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sorrento sandy loam and of Yolo sandy loam. Also included are a few small areas of Metz soils in lower lying areas that are subject to occasional flooding.

This Metz soil is used for irrigated crops, dryland farming, and wildlife habitat. Capability unit IIIs-4 (19) irrigated; range site not assigned.

Metz loamy sand, 2 to 9 percent slopes (MfC).--This soil is on alluvial fans along the Santa Clara River and its major tributaries. In most places slopes range from 2 to 5 percent. Runoff is slow, and the hazard of erosion is slight.

Included with this soil in mapping are some areas at the head of narrow canyons that have slopes of 12 or 14 percent. Also included are small areas of Cortina sandy loam, Cortina cobbly sandy loam, and Yolo loam. In many places in Sand Canyon, the soil has been mixed, leveled, and shaped by earthmoving equipment. In these places much of the soil has been roughly bench terraced.

This Metz soil is used about the same as Metz loamy sand, 0 to 2 percent slopes. Capability unit IIIs-4 (19) irrigated; range site not assigned.

Metz loam, 0 to 2 percent slopes (MgA).--This soil is on flood plains north of Saugus. The surface layer is loam about 8 to 16 inches thick, but otherwise this soil is similar to Metz loamy sand, 0 to 2 percent slopes. In many places reaction is mildly alkaline.

Runoff is very slow on this soil, and the hazard of erosion is slight to none. Available water holding capacity is 5.0 to 6.0 inches. Fertility is moderate.

Included with this soil in mapping are small areas of Metz loamy sand.

This Metz soil is used mainly for alfalfa and for row crops. Capability unit IIs-4 (19) irrigated; range site not assigned.

Metz loam, 2 to 5 percent slopes (MgB).--The surface layer of this soil is loam that is about 8 to 10 inches thick. Slopes range from 2 to 3 percent in most places. Sheet and rill erosion are minor.

Runoff is slow on this soil, and the hazard of erosion is slight. Available water holding capacity is 5.0 to 6.0 inches. Fertility is moderate.

Included with this soil in mapping are small areas of Metz loamy sand.

This Metz soil is used for irrigated alfalfa and small grains. Capability unit IIs-4 (19) irrigated; range site not assigned.

Millsholm Series

The Millsholm series consists of well-drained soils that formed in material weathered from hard shale and fine-grained sandstone. These soils are on uplands that include fault scarps. Slopes range from 15 to 50 percent. The vegetation consists of fairly thin stands of chamise that have a thin understory of annual grasses and forbs. Elevation ranges from 2,000 to 3,000 feet. Average annual precipitation ranges from about 14 to 16 inches, average annual temperature is about 62° F., and the frost-free season ranges from about 240 to 270 days. Millsholm soils are associated mainly with Gaviota soils.

In a typical profile the surface layer is pale-brown loam about 6 inches thick. Below is brown heavy loam that contains some weathered shale fragments and is about 10 inches thick. Hard shale and sandstone parent rock is at a depth of about 16 inches.

These soils are used for range, wildlife habitat, recreation, and watershed purposes.

Millsholm rocky loam, 30 to 50 percent slopes, eroded (MhF2).--This soil is on uplands throughout the western part of the survey area. Rocks crop out on 2 to 4 percent of the acreage.

Typical profile (0.5 mile north of Martin Ranch on Old Ridge Route Road; 250 yards east on private access road that leads to microwave station; 40 feet east of this road; SW1/4NE1/4 sec. 35, T. 6 N., R. 17 W.):

A1--0 to 6 inches, pale-brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common very fine and fine roots; common micro irregular pores and very fine tubular pores; neutral (pH 7.2); clear, smooth boundary; horizon 4 to 8 inches thick.

B2--6 to 16 inches, brown (10YR 5/3) heavy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, slightly sticky and plastic when wet; common very fine and fine roots; many micro irregular pores and common very fine tubular pores; a few thin clay films in pores and as bridges; about 10 percent, by volume, is weathered shale fragments; neutral (pH 7.2); gradual, smooth boundary; horizon 10 to 12 inches thick.

R--16 inches, hard shale and fine-grained sandstone.

The A1 horizon ranges from pale brown to brown or yellowish brown in color. Texture ranges from loam to near silt loam. Outcrops of rock occupy 2 to 4 percent of the surface. The B2 horizon ranges from pale brown to brown or yellowish brown in color. Throughout the profile, reaction ranges from slightly acid to neutral. Depth to which roots can penetrate ranges from 14 to 20 inches, but it commonly is about 16 inches. In most places the slope is about 45 percent, but along fault scarps it is as much as 55 percent. Sheet and rill erosion are moderate in most areas. Shallow gullies cut a few areas.

This soil is moderately permeable. Available water holding capacity is 2.0 to 3.0 inches. Fertility is low. Runoff is rapid, and the hazard of erosion is high.

Included with this soil in mapping are about 500 acres that are very rocky. This very rocky area is in the Castaic Creek drainageway northeast of the old Cordova Ranch. Also included are small areas of Castaic silty clay loam and of Gaviota rocky sandy loam. Other included areas consist of tracts of soil, 5 to 20 acres in size, that have a surface layer of silty clay loam.

This Millsholm soil is used for range, wildlife, and watershed purposes. Capability unit VIIe-1 (19) dryland; range site 4.

Millsholm rocky loam, 15 to 30 percent slopes, eroded (MhE2).--Most areas of this soil are on foothills in the western part of the survey area. Slopes range from about 20 to 24 percent in most places. Sheet and rill erosion are moderate in most of the area. A few areas are cut by deep gullies. Runoff is medium to rapid, and the hazard of further erosion is moderate to high.

Included with this soil in mapping are small areas of soil that have slopes of 5 to 15 percent.

This Millsholm soil is used for range, wildlife, and recreation. Capability unit VIIe-1 (19) dryland; range site 4.

Mocho Series

The Mocho series consists of moderately well-drained soils that have formed in sedimentary alluvium. These soils are on alluvial fans along major drainageways. Slopes are 0 to 9 percent. The vegetation is grasses and oaks. Elevations range from 1,175 to 1,225 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 63° F., and the frost-free season ranges from 275 to 300 days. Mocho soils are associated with Metz, Sorrento, and Yolo soils.

Typically the surface layer is grayish-brown loam about 15 inches thick. Below is grayish-brown and light brownish-gray calcareous loam to a depth of more than 60 inches. In some places the surface layer is sandy loam.

These soils are used for dryland and irrigated crops.

Mocho loam, 0 to 2 percent slopes (MpA).--This soil is on alluvial fans south of Castaic Junction.

Typical profile (0.6 mile south of the main office of the Newhall Land and Cattle Company at Castaic Junction, along the farm road leading to cattle feeding lots):

Ap--0 to 5 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate, very fine and fine, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; very slightly effervescent; disseminated lime; moderately alkaline (pH 8.2); gradual, smooth boundary; horizon 5 to 6 inches thick.

A1--5 to 15 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; common micro irregular pores and a few very fine and fine tubular pores; slightly effervescent; disseminated lime; moderately alkaline (pH 8.2); clear, smooth boundary; horizon 5 to 12 inches thick.

C1--15 to 29 inches, grayish-brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; many micro irregular pores, many very fine tubular pores, and a few fine and medium tubular pores; common, fine, distinct, yellow (2.5Y 7/6) mottles; many worm casts; violently effervescent; disseminated lime; moderately alkaline (pH 8.4); abrupt, wavy boundary; horizon 14 to 16 inches thick.

C2--29 to 33 inches, light brownish-gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; many micro irregular pores and a few very fine tubular pores; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; about 8 percent, by volume, is gravel; violently effervescent; medium, rounded lime masses; strongly alkaline (pH 8.6); abrupt, wavy boundary; horizon 4 to 5 inches thick.

C3--33 to 90 inches, grayish-brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; common micro irregular pores, many very fine tubular pores, and a few fine and medium tubular pores; common, medium, distinct, reddish-yellow (7.5YR 6/6) mottles; strongly effervescent; disseminated lime; contains fine, rounded lime in round masses and as filaments or threads; moderately alkaline (pH 8.4).

In color the A horizon ranges from grayish brown to brown or dark grayish brown. The C horizon ranges from grayish brown to brown or light brownish gray in color. It is loam or light clay loam in texture. At a depth below 40 inches, the material generally is thinly stratified. Throughout the profile, reaction ranges from mildly alkaline to strongly alkaline and from weakly calcareous to strongly calcareous. In places lime also occurs as filaments or threads, as soft masses, or as fine concretions. Fine mottles range from none to few in abundance, and from faint to distinct in contrast.

This soil is moderately permeable. Available water holding capacity is 8 to 10 inches. Fertility is high. Runoff is very slow, and the hazard of erosion is none to slight. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Metz loamy sand, of Sorrento loam, and of Yolo loam.

This soil is used for dryland and irrigated crops. Capability unit I-1 (19) irrigated; range site not assigned.

Mocho loam, 2 to 9 percent slopes (MpC).--This soil occupies fairly narrow alluvial fans near Castaic Junction. In most places slopes range from 2 to 5 percent. In places at the heads of fans, a few pebbles or cobblestones are on the surface. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

Included with this soil in mapping are small areas of Metz loamy sand, of Sorrento loam, and of Yolo loam. Also included are areas, 5 to 10 acres in size, where sheet and rill erosion are moderate.

This Mocho soil is used about the same as Mocho loam, 0 to 2 percent slopes. Capability unit IIe-1 (19) irrigated; range site not assigned.

Mocho sandy loam, 0 to 2 percent slopes (MoA).--This soil is near Castaic Junction The surface layer is brown sandy loam that generally is massive and slightly hard. It is 10 to 12 inches thick.

The hazard of erosion is slight on this soil, and runoff is very slow. Available water holding capacity is 7.5 to 9.5 inches.

Included with this soil in mapping are small areas of Metz loamy sand, of Sorrento loam, and of Yolo loam.

This Mocho soil is used about the same as Mocho loam, 0 to 2 percent slopes. Capability unit I-1 (19) irrigated; range site not assigned.

Mohave Series

In the Mohave series are well-drained soils that have formed in granitic alluvium. These soils are on terraces. Slopes range from 2 to 5 percent. The vegetation is sparse stands of Joshua-trees, desert stipa, and annual grasses and forbs. Elevations range from 2,450 to 2,700 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is about 62° F., and the frost-free season ranges from 240 to 260 days. Mohave soils are associated with Adelanto soils.

The surface layer in a typical profile is grayish-brown and brown coarse sandy loam about 6 inches thick. Below is about 50 inches of dark-brown, reddish-brown, brown, and light-brown sandy clay loam, coarse sandy loam, and loamy coarse sand. Brown gravelly coarse sand that generally is stratified is at a depth of about 56 inches.

These soils are used for range, as wildlife habitat, and as homesites.

Mohave coarse sandy loam, 2 to 5 percent slopes (MzB).--This is the only Mohave soil mapped in the county. It is on somewhat dissected terraces southeast of Quartz Hill.

Typical profile (on White Fence Farm subdivision; 0.3 mile west on 20th Street West and Avenue 0-8; NW1/4SE1/4 sec. 14 T. 6 N., R. 12 W.):

A11--0 to 2 inches, grayish-brown (10YR 5/2) coarse sandy loam, dark brown (10YR 3/3) moist; weak, medium and coarse, granular structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; many very fine roots; many very fine irregular pores and a few very fine tubular pores; medium acid (pH 6.0); clear, smooth boundary; horizon 1 to 2 inches thick.

A12--2 to 6 inches, brown (10YR 5/3) coarse sandy loam, dark brown (7.5YR 4/3) moist; weak, medium, subangular blocky structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; common very fine roots and a few fine and medium roots; many very fine irregular pores, common very fine tubular pores, and a few fine tubular pores; medium acid (pH 6.0); abrupt, smooth boundary; horizon 4 to 10 inches thick.

B21t--6 to 19 inches, reddish-brown (5YR 4/4) heavy sandy clay loam, reddish brown (5YR 4/4) moist; strong, coarse, prismatic structure; very hard when dry, firm when moist, sticky and plastic when wet; a few fine roots between peds and a few fine and medium horizontal roots within peds; all roots are within upper few inches of horizon; a few fine tubular pores; many thick dark reddish-brown (5YR 3/4) clay films on ped faces, and continuous thick clay films in pores; some prisms have bleached sand grains on their tops; slightly acid (pH 6.5); gradual,

smooth boundary; horizon 12 to 15 inches thick.

B22t--19 to 30 inches, dark-brown (7.5YR 4/4) coarse sandy clay loam, same color when moist; weak, medium, prismatic structure; very hard when dry, firm when moist, sticky and slightly plastic when wet; a few very fine roots between peds; a few fine tubular and irregular pores; many thick clay films on ped faces and continuous thick clay films in pores; noncalcareous; mildly alkaline (pH 7.8); gradual, smooth boundary; horizon 10 to 12 inches thick.

B31--30 to 42 inches, brown (7.5YR 5/4) coarse sandy loam, dark brown (7.5YR 4/5) moist; massive; very hard when dry, friable when moist, slightly sticky and nonplastic when wet; no roots; common very fine irregular pores; common moderately thick clay films in pores; a few strata of sandy loam; strongly effervescent; large, segregated, indistinct lime spots in about 25 percent of the mass; moderately alkaline (pH 8.0); gradual, smooth boundary; horizon 10 to 13 inches thick.

B32--42 to 56 inches, light-brown (7.5YR 6/4) loamy coarse sand, brown (7.5YR 4/4) moist, that includes thin reddish-brown (5YR 4/4) layer of sandy loam; massive; soft when dry but thin reddish-brown layer is very hard, very friable when moist, nonsticky and nonplastic when wet; no roots; many very fine and fine irregular pores; continuous thin colloidal stains on mineral grains; strongly effervescent; large segregations of lime occupy most of the mass; moderately alkaline (pH 8.0); gradual, smooth boundary; horizon 14 to 18 inches thick.

C--56 to 62 inches, brown (7.5YR 5/4) gravelly loamy coarse sand, dark brown (7.5YR 4/4) moist; single grain; loose when dry, very friable when moist, nonsticky and nonplastic when wet; about 25 percent, by volume, is fine gravel; slightly effervescent; disseminated lime; neutral (pH 7.2).

The A horizon ranges from grayish brown to brown and yellowish brown or strong brown. It ranges from loamy coarse sand to coarse sandy loam in texture. Structure is granular and subangular blocky. Reaction ranges from slightly acid or medium acid to neutral. The B2t horizon is reddish brown or dark brown in color. Texture ranges from heavy sandy clay loam to coarse sandy clay loam or clay loam. Structure is prismatic to angular blocky. The B3 horizon ranges from brown to light brown in color. It is coarse sandy loam or loamy coarse sand in texture. Color of the C horizon ranges from brown to strong brown or yellowish brown. The content of lime in the profile varies, but most horizons below a depth of 30 inches are slightly to strongly effervescent and contain disseminated lime.

Permeability is moderately slow in this soil. Available water holding capacity is 7.5 to 9.0 inches. Fertility is low. Runoff is low, and the hazard of water erosion is slight. The hazard of soil blowing is slight to moderate. Roots can penetrate the soil fairly well, though in many places penetration of the B2t horizon is restricted.

Included with this soil in mapping are small areas of Adelanto coarse sandy loam. Also included are long narrow stringers of Cajon loamy sand that fill old drainageways of intermittent streams. Other included small areas consist of about 300 acres of soil that has slopes of less than 2 percent.

Mohave coarse sandy loam, 2 to 5 percent slopes, is used for range in spring, for wildlife habitat, and for homesites. Capability unit IIe-1 (30) irrigated, VIIe-1 (30) dryland; range site 7.

Oakdale Series

The Oakdale series consists of well-drained soils that formed in old granitic alluvium. These soils are on terraces. Slopes range from 2 to 9 percent. The vegetation is chiefly annual grasses and forbs and scattered big sagebrush, rabbitbrush, and California juniper. Elevations range from 3,000 to 3,400 feet. Average annual precipitation ranges from 9 to 12 inches, average annual temperature is about 60° F., and the frost-free season ranges from 210 to 230 days. Oakdale soils are associated with Greenfield and Ramona soils.

Typically the surface layer is grayish-brown sandy loam about 25 inches thick. Below is brown and reddish-yellow heavy sandy loam and gravelly heavy sandy loam that is about 45 inches thick and contains thin layers of clay that differ in color. Reddish-yellow gravelly coarse sandy loam that generally is stratified is at a depth of about 70 inches.

These soils are used for dryland small grains and range and as wildlife habitat.

Oakdale sandy loam, 2 to 9 percent slopes (OaC).--This is the only Oakdale soil mapped in the Area. It occupies broad terraces northwest of Neenach.

Typical profile (in Kern County; 45 feet south of fence and 0.4 mile west of the corner of sec. 26, T. 9 N., R. 16 W.):

Ap1--0 to 7 inches, grayish-brown (10YR 5/2) sandy loam near loam, very dark grayish brown (10YR 3/2) moist; moderate, very fine, granular structure; slightly hard when dry, firm when moist, slightly sticky and nonplastic when wet; common micro and very fine roots; common micro irregular pores; about 10 percent, by volume, is fine gravel; slightly acid (pH 6.5); abrupt, smooth boundary; horizon 6 to 8 inches thick.

Ap2--7 to 8 inches, grayish-brown (10YR 5/2) sandy loam near loam, very dark grayish brown (10YR 3/2) moist; massive; hard to very hard when dry, firm when moist, slightly sticky and nonplastic when wet; a few micro and very fine roots; a few micro irregular pores; horizon appears to be a plowpan; slightly

acid (pH 6.2); abrupt, smooth boundary; horizon 1 to 2 inches thick.

A1--8 to 25 inches, grayish-brown (10YR 5/2) sandy loam near loam, very dark grayish brown (10YR 3/2) moist; massive; hard when dry, firm when moist, slightly sticky and plastic when wet; common micro and fine roots and a few very fine roots; many micro irregular pores, common very fine tubular pores, and a few fine tubular pores; about 5 to 10 percent, by volume, is fine gravel; neutral (pH 6.8); clear, smooth boundary; horizon 15 to 18 inches thick.

B2t--25 to 52 inches, brown (7.5YR 5/3) heavy sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard to hard when dry, friable when moist, slightly sticky and nonplastic when wet; a few very fine and fine roots; about 5 to 10 oblique, dark reddish-brown (5YR 3/4 moist) layers that are 3/8 to 3/4 inch thick, are 4 to 8 inches apart, and have common moderately thick clay films on them; continuous thin clay films as bridges between mineral grains and a few thin clay films in pores; about 10 to 12 percent is rounded granitic gravel; neutral (pH 6.8); gradual, wavy boundary; horizon 26 to 30 inches thick.

B3t--52 to 70 inches, reddish-yellow (7.5YR 6/6) gravelly heavy sandy loam, strong brown (7.5YR 5/6) moist; massive; slightly hard to hard when dry, friable when moist, slightly sticky and nonplastic when wet; a few micro and very fine roots; many micro irregular pores, common very fine tubular pores, and a few fine tubular pores; about 25 percent, by volume, is gravel; from 5 to 12 wavy, discontinuous, dark reddish-brown (5YR 3/4) layers that are 1/2 to 1 inch thick, are 3 to 10 inches apart, and have common moderately thick clay films on them; contains one or two clay balls that are similar in color and about 2 inches in diameter; continuous thin clay films in matrix as bridges between mineral grains and a few moderately thick clay films in pores; neutral (pH 6.8); gradual, wavy boundary; horizon 16 to 20 inches thick.

C--70 to 80 inches, reddish-yellow (7.5YR 6/6) gravelly coarse sandy loam, strong brown (7.5YR 5/6) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro irregular pores and a few very fine tubular pores; about 20 to 25 percent is gravel; slightly acid (pH 6.5).

The A horizon is grayish brown, dark grayish brown, brown, or dark gray in color. It is granular in structure or is massive. In many places a plowpan occurs below the Ap1 horizon. The Bt horizon generally is brown or light brown in color, but it is reddish brown or reddish yellow in places. Texture generally ranges from heavy sandy loam to gravelly heavy sandy loam, but it is sticky gravelly loam in places. Thin layers of clay are common in the Bt horizon and add to the clay content. The Bt horizon generally is massive, but in a few places structure is weak blocky. The soil typically is slightly acid to neutral throughout the profile. Slopes generally range from 2 to 5 percent.

Permeability is moderate in this soil. Available water holding capacity is 7.5 to 9.0 inches. Fertility is moderate. Runoff is slow to medium, and in many places the water cannot readily penetrate the soil. The hazard of water erosion is slight to moderate. Roots can penetrate to a depth of 60 inches.

Included with this soil in mapping are some areas, less than 40 acres in size, where slopes are less than 2 percent. Also included are small areas of Greenfield sandy loam and of Ramona coarse sandy loam. Other included areas, 10 to 20 acres in size, have a surface layer of loam and coarse sandy loam. Small areas where rill and water erosion are moderate also are included, as well as a few areas at the head of intermittent streams that are cut by deep gullies.

Oakdale sandy loam, 2 to 9 percent slopes, is used for dryland small grains, range, and wildlife. Capability unit IVec-1 (19) dryland; range site 2.

Oak Glen Series

The Oak Glen series consists of well-drained soils that have formed in granitic alluvium. These soils are on alluvial fans. Slopes are 0 to 9 percent. The vegetation is grasses and oaks. Elevations range from 3,400 to 4,000 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is 57° F., and the frost-free season ranges from about 175 to 200 days. Oak Glen soils are associated with Gorman soils.

In a typical profile the surface layer is grayish-brown sandy loam about 32 inches thick. Below is grayish-brown and brown fine sandy loam, loamy coarse sand and sandy loam that extends to a depth of 70 inches or more. In some places texture is gravelly sandy loam throughout the profile, and in other places it is loam.

These soils are used mostly for dryland small grains, for range, and as wildlife habitat.

Oak Glen sandy loam, 2 to 9 percent slopes (ObC).--This soil is on long smooth alluvial fans near Gorman and Quail Lake. In most places slopes are 3 to 5 percent.

Typical profile (1.5 miles west of the headquarters of the old Liebre Ranch; SW1/4SW1/4 sec. 20, T. 8 N., R. 17 W.):

A11--0 to 10 inches, grayish-brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; many micro roots and common very fine roots; many micro irregular pores and common very fine tubular pores; slightly acid (pH 6.5); abrupt, smooth boundary; horizon 10 to 12 inches thick.

A12--10 to 32 inches, grayish-brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few medium roots; common micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.5); clear, smooth boundary; horizon 14 to 22 inches thick.

C1--32 to 62 inches, grayish-brown (10YR 5/2) fine sandy loam near very fine sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard when dry, friable when moist, nonsticky and slightly plastic when wet; a few micro roots and a few fine and medium roots; common micro irregular pores and very fine tubular pores; slightly acid (pH 6.5); abrupt, smooth boundary; horizon 28 to 32 inches thick.

C2--62 to 70 inches, brown (10YR 5/3) loamy coarse sand, dark brown (10YR 4/3) moist; weak, fine and medium, subangular blocky structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; a few medium and very fine roots; common micro irregular pores and a few very fine tubular pores; medium acid (pH 6.0); abrupt, smooth boundary; horizon 8 to 10 inches thick.

C3--70 to 80 inches, grayish-brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; a few medium roots; common micro irregular pores and a few fine tubular pores; slightly acid (pH 6.5); boundary undetermined.

Color of the A horizon is grayish brown, dark grayish brown, dark gray, or gray. The C horizon is grayish brown or brown in color and sandy loam, fine sandy loam, or loamy coarse sand in texture. Throughout the profile reaction is slightly acid to medium acid. Granitic gravel occurs throughout the profile in some places, and the amount generally increases with increasing depth. Gravel ranges from none to as much as 15 percent, by volume, of the profile.

Permeability is moderately rapid in this soil. Available water holding capacity is 6.0 to 7.5 inches. Fertility is high. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Roots penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Oak Glen gravelly sandy loam and of Hanford coarse sandy loam. Also included are areas of unnamed soils, 10 acres or less in size, that have a surface layer of loam and coarse sandy loam. Other included unnamed stony or cobbly soils occupy areas that are 2 to 8 acres in size. In some included areas the soils are calcareous at a depth below 40 inches, and in other included areas the average annual temperature is higher than 57° F. Also included are some other areas, about 40 acres or less in size, where sheet and rill erosion are moderate.

This Oak Glen soil is used for dryland small grains and for range. Capability unit IIIe-1 (20) dryland; range site 2.

<u>Oak Glen sandy loam, 0 to 2 percent slopes</u> (ObA).--This soil is on broad smooth alluvial fans near Quail Lake. Runoff is slow, and the hazard of erosion is slight.

Included with this soil in mapping are small areas of Hanford coarse sandy loam.

This soil is used mostly for dryland small grains and for range. A small acreage is in dryland almond orchards. Capability unit IIIc-1 (20) dryland; range site 2.

<u>Oak Glen gravelly sandy loam, 2 to 9 percent slopes</u> (OcC).--Except that this soil is gravelly throughout, it is similar to Oak Glen sandy loam, 2 to 9 percent slopes. The gravel consists of rounded granitic material that is about 2 inches or less in diameter. It makes up from 15 to about 35 percent, by volume, of the mass. Because of the gravel, available water holding capacity is less than in Oak Glen sandy loam, 2 to 9 percent slopes, and tillage is more difficult.

Runoff is slow to medium on this soil, and the hazard of erosion is slight to moderate. Available water holding capacity is about 4.0 to 6.0 inches.

Included with this soil in mapping are small areas of Oak Glen sandy loam. Also included are areas of an unnamed soil in which the content of gravel ranges from 35 to 65 percent, by volume. This unnamed soil occupies as much as 15 or 20 percent of each soil area. A few areas of a soil that has slopes of 12 to 14 percent are also included.

This Oak Glen soil is used for range and as wildlife habitat. Capability unit IIIe-1 (20) dryland; range site 2.

<u>Oak Glen loam, 0 to 2 percent slopes</u> (OdA).--Most areas of this soil are in Oso Canyon. The surface layer is dark-gray light loam about 46 inches thick. The substratum is pale brown and ranges from heavy sandy loam to heavy coarse sandy loam and light loam. It is less than 18 percent clay.

This soil is moderately permeable. Available water holding capacity is 8 to 10 inches. Fertility is high, but the growing season is shorter than in other areas of Oak Glen soils. Runoff is very slow, and the hazard of erosion is none to slight. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Oak Glen sandy loam. Here cattle have trampled the surface, and the soil is hard and massive when dry.

This Oak Glen soil is used for range and as wildlife habitat. Capability unit IIIc-1 (20) dryland; range site 2.

<u>Oak Glen loam, 2 to 9 percent slopes</u> (OdC).--Except that the surface layer is dark-gray loam, this soil is similar to Oak Glen sandy loam, 2 to 9 percent slopes. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

Included with this soil in mapping are about 700 acres of soil that has a surface layer about 14 to 16 inches thick. The substratum of this included soil is brown loam or clay loam that extends to a depth of 60 inches or more. From 2 to 15 percent, by volume, of this included soil is limestone gravel. Soil reaction is neutral throughout.

This Oak Glen soil is used for range. Capability unit IIIe-1 (20) dryland; range site 2.

Oban Series

In the Oban series are moderately well drained soils that have formed in granitic alluvium. These soils are in valley troughs. Slopes are 0 to 2 percent. The vegetation consists of fourwing saltbush, alkali sacaton, iodine bush, alkali blite, saltgrass, and annual grasses and forbs. Elevations range from 2,310 to 2,350 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is about 62° F., and the frost-free season ranges from about 240 to 260 days. Oban soils are associated with Pond and Tray soils.

Typically the surface layer is light yellowish-brown fine sandy loam about 4 inches thick. The subsoil is pale-brown, yellowish-brown, and light olive-brown heavy clay loam and heavy loam about 27 inches thick. It is underlain by light olive-brown and very pale brown gravelly coarse sandy loam and gravelly coarse sand. Exchangeable sodium is high.

These soils have slow permeability. Available water holding capacity is 7.5 to 9.0 inches. Fertility is very low. Runoff is very slow, and the hazard of water erosion is none to slight. The hazard of soil blowing is moderate. Roots can penetrate to a depth of 60 inches in some places, but in most places the subsoil restricts root penetration.

Oban soils are used for grazing in spring and as wildlife habitat. In this survey area Oban soils are closely intermingled with areas of Pond soils and are mapped in a complex with them. The complex is described under the Pond series.

Typical profile of an Oban fine sandy loam (NE1/4 of NE1/4 sec. 20, T. 8 N., R. 12 W.):

A1--0 to 4 inches, light yellowish-brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; a few very fine roots and common micro roots; common micro irregular pores, a few very fine irregular pores, and a few very fine tubular pores; moderately alkaline (pH 8.3); abrupt, smooth boundary; horizon 4 to 12 inches thick.

B21t--4 to 14 inches, pale-brown (10YR 6/3) heavy clay loam, brown (10YR 5/3) moist; strong, medium and coarse, columnar structure; massive caps of sandy loam on the columns that are very pale brown (10YR 7/3) and are 1/4 to 3/8 inch thick; very hard when dry, friable when moist, sticky and plastic when wet; common micro roots and a few very fine and medium roots; common micro irregular pores and micro tubular pores; common moderately thick clay films on ped faces and many moderately thick clay films in pores and as bridges; violently effervescent; disseminated lime; very strongly alkaline (pH 9.2); clear, smooth boundary; horizon 8 to 11 inches thick.

B22tca--14 to 25 inches, yellowish-brown (10YR 5/4) heavy clay loam, dark yellowish brown (10YR 4/4) moist; strong, medium, angular blocky structure; very hard when dry, very firm when moist, sticky and plastic when wet; common micro roots and a few very fine roots; common micro and very fine irregular pores and a few micro tubular pores; common thick clay films on ped faces and many moderately thick clay films in pores and as bridges; strongly effervescent to violently effervescent; disseminated lime and lime in soft masses; very strongly alkaline (pH 9.2); gradual, wavy boundary; horizon 10 to 13 inches thick.

B3tca--25 to 31 inches, light olive-brown (2.5Y 5/4) heavy loam, olive brown (2.5Y 4/4) moist; massive; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; common micro roots and a few very fine roots; common micro and very fine irregular pores and a few very fine tubular pores; many moderately thick clay films in pores and as bridges; strongly effervescent; disseminated lime and lime in soft masses and in filaments or threads; very strongly alkaline (pH 9.4); gradual, smooth boundary; horizon 5 to 8 inches thick.

C1ca--31 to 39 inches, light olive-brown (2.5Y 5/4) gravelly coarse sandy loam, olive brown (2.5Y 4/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro and very fine irregular pores; about 15 to 20 percent, by volume, is fine gravel; violently effervescent; lime in soft masses and filaments or threads; strongly alkaline (pH 8.8); gradual, smooth boundary; horizon 8 to 10 inches thick.

C2ca--39 to 53 inches, very pale brown (10YR 7/4) gravelly coarse sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro and very fine irregular pores; about 25 percent, by volume, is fine gravel; violently effervescent; disseminated lime and lime in soft masses; strongly alkaline (pH 8.8).

The A1 horizon ranges from light yellowish brown to pale brown in color. It contains lime in some places. Structure is thin to medium, weak or moderate, platy, or the soil is massive. In places a discontinuous A2 horizon is present that ranges from 1/8 to 3/8 inch in thickness.

The B2t horizon typically has strong to moderate columnar or prismatic structure in the upper part

and angular blocky structure in the lower part. It ranges from heavy clay loam to silty clay and is brown, pale brown, or yellowish brown. Reaction is strongly alkaline to very strongly alkaline. More than 15 percent exchangeable sodium is present in some or all parts of the B2t horizon. Salinity is moderate to severe. A B3tca horizon generally is present.

The C horizon ranges from gravelly coarse sand to clay loam in texture and from light olive brown to pale brown or very pale brown in color. In many places thin plates or lenses of lime-cemented material occur and the horizon is stratified.

Ojai Series

Soils of the Ojai series are well drained. They have formed in weakly consolidated sedimentary alluvium that contains somewhat weathered pebbles and cobblestones of mixed origin. These soils are on terraces and foothills. Slopes range from 2 to 50 percent. The vegetation is mainly annual grasses and oaks, but some chamise and manzanita grow on the foothills. Elevations range from 1,300 to 2,200 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is 63° F., and the frost-free season ranges from 275 to 300 days. Ojai soils are associated with Balcom, Castaic, and Saugus soils.

In a typical profile the surface layer is grayish-brown and brown loam about 25 inches thick. The subsoil is reddish-brown and brown clay loam about 28 inches thick. It is underlain by reddish-yellow sandy loam that has lenses of gravelly sandy loam and is stratified.

These soils are used for dryland and irrigated crops. They also are used for range, for homesites, as wildlife habitat, and for watershed purposes.

Ojai loam, 2 to 9 percent slopes (OgC).--This soil is on terraces near Saugus.

Typical profile (west of Saugus; 2.1 miles south of the Saugus-Ventura Road, southward through power substation property, and 200 yards north of large oak tree):

A11--0 to 14 inches, grayish-brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.2); gradual, smooth boundary; horizon 10 to 14 inches thick.

A12--14 to 25 inches, brown (7.5YR 5/4) heavy loam, dark brown (7.5YR 4/4) moist; moderate, fine and medium, subangular blocky structure; hard when dry, friable when moist, nonsticky and slightly plastic when wet; a few micro and very fine roots; common micro irregular pores and very fine tubular pores; a few very thin clay films occur as bridges between mineral grains; about 5 percent, by volume, is gravel; slightly acid (pH 6.2); abrupt, wavy boundary; horizon 6 to 12 inches thick.

B2t--25 to 37 inches, reddish-brown (5YR 5/4) clay loam, reddish brown (5YR 4/4) moist; strong, medium, prismatic structure; very hard when dry, firm to very firm when moist, sticky and very plastic when wet; common micro roots between ped faces and a few micro roots in peds; a few micro irregular pores and very fine tubular pores; continuous moderately thick clay films on ped faces; some prisms have caps of bleached sand grains that are 1/8 inch thick; slightly acid (pH 6.5); gradual, smooth boundary; horizon 12 to 20 inches thick.

B3t--37 to 53 inches, brown (7.5YR 5/4) clay loam, dark brown (7.5YR 4/4) moist; moderate, medium and coarse, angular blocky structure; hard when dry, firm when moist, slightly sticky and plastic when wet; a few micro roots; common micro irregular pores and a few very fine tubular pores; many reddish-brown (5YR 5/4) moderately thick clay films on ped faces; common, fine, distinct, black (10YR 2/1) manganese stains and soft concretions; neutral (pH 6.8); gradual, wavy boundary; horizon 12 to 16 inches thick.

C--53 to 60 inches, reddish-yellow (7.5YR 6/6) sandy loam, strong brown (7.5YR 5/6) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro irregular pores; common, fine, distinct, black (10YR 2/1) manganese stains and concretions; about 10 to 15 percent is gravel; slightly acid (pH 6.5).

The A11 and A12 horizons are grayish brown, brown, dark brown, or dark grayish brown in color and loam or heavy loam in texture. In places a light brownish-gray A2 horizon occurs that generally is indistinct but that in a few places is 1/8 to 3/8 inch thick. The lower part of the A12 horizon contains degraded remnants from the upper part of the B2t horizon. The B2t horizon ranges from clay loam to silty clay loam or sandy clay loam in texture and has prismatic and angular blocky structure. Thin caps of bleached mineral grains are on the prisms in the upper part of the B2t horizon. The B3t horizon ranges from clay loam to silty clay loam or sandy clay loam in texture. Gravel makes up as much as 15 percent, by volume, of the B2t and B3t horizons, and cobblestones, as much as 5 percent. In places a stoneline occurs in the upper part of the B3t horizon. The C horizon ranges from sandy loam to loam or gravelly sandy loam in texture, and from reddish yellow to light yellowish brown or brownish yellow in color. Reaction generally is slightly acid in the upper part of the solum, but it becomes neutral with increasing depth.

This soil has moderately slow permeability. Available water holding capacity is 9 to 11 inches. Fertility is low. Tilth is poor. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Roots can penetrate to a depth of about 60 inches.

Included with this soil in mapping are small areas of Ojai loam, 9 to 15 percent slopes. Also included are small areas of Zamora loam.

This Ojai soil is used for irrigated alfalfa, row crops, and range. It also is increasingly being used as sites for homes and industries. Some areas on terraces northwest of Solemint and south of the Saugus-Ventura Road near the power substation have been shaped and altered by earthmoving equipment. These areas now have houses on them or are used as golf courses. Capability unit IIIe-1 (19) irrigated; range site 2.

Ojai loam, 9 to 15 percent slopes (OgD).--This soil is on foothills. Most areas are strongly sloping, but some areas are rolling. Slopes range from 10 to 15 percent in most places. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are small areas where sheet and rill erosion are moderate. Also included are a few deep gullies. Other included small areas consist of Ojai loam, 15 to 30 percent slopes.

This Ojai soil is used mostly for range, but some areas are used for dryland small grains. The areas also provide habitat for wildlife. Capability unit IVe-1 (19) irrigated; range site 2.

Ojai loam, 15 to 30 percent slopes (OgE).--This soil is on foothills near Solemint. Slopes range from 20 to 26 percent in most places. Runoff is medium to rapid, and the hazard of erosion is moderate to high.

Included with this soil in mapping are some areas, 10 to 20 acres in size, where sheet and rill erosion are moderate. Also included are a few deep gullies. Other included small areas consist of Ojai loam, thin surface variant, 30 to 50 percent slopes, and Ojai loam, 30 to 50 percent slopes, eroded.

This Ojai soil is used for range, wildlife habitat, and watershed. The slopes severely limit suitability for cultivation. Capability unit VIe-1 (19) dryland; range site 2.

Ojai loam, 30 to 50 percent slopes (OgF).--This soil is on foothills near Castaic, Saugus, and Solemint. Slopes generally range from 35 to 45 percent. Runoff is rapid, and the hazard of erosion is high.

Included with this soil in mapping are small areas of Ojai loam, 15 to 30 percent slopes. Also included are about 280 acres at the head of Plum Canyon that consist of Ojai soils that have a surface layer of clay loam. Small areas cut by sheet and rill erosion also are included.

This Ojai soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (19) dryland; range site 2.

Ojai loam, 30 to 50 percent slopes, eroded (OgF2).--Much of the original surface layer of this soil has been removed through sheet and rill erosion. The present surface layer is 16 to 18 inches thick in most places. Slopes commonly are about 40 percent. The areas are cut by a few deep gullies and by many shallow gullies. Runoff is rapid, and the hazard of further erosion is high.

This Ojai soil is suitable for range, wildlife habitat, and watershed purposes. Capability unit VIIe-1 (19) dryland; range site 2.

Ojai-Zamora loams, 15 to 30 percent slopes (OzE).--This complex is under grasses and oaks on short, hilly side slopes near Saugus. The Ojai soil occupies about 60 percent of each area, and the Zamora soil, the remaining 40 percent. The profile of the Ojai soil is similar to the one described in Ojai loam, 2 to 9 percent slopes, and the profile of the Zamora soil is similar to the one described in Zamora loam, 2 to 9 percent slopes. Runoff is medium to rapid, and the hazard of erosion is moderate to high.

All of this complex is used for range. Capability unit VIe-1 (19) dryland; range site 2.

Ojai Series, Thin Surface Variant

These variants from the normal Ojai soils are well drained. They have formed on uplifted, loose sedimentary alluvium. The alluvium is made up of rounded waterworn pebbles and cobblestones that consist of basalt, granite, and schist. Slopes range from 30 to 50 percent. These soils are in Tapic Canyon. The vegetation consists of stands of chamise that have a sparse understory of annual grasses and forbs. Elevations range from 2,200 to 2,600 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is 63° F., and the frost-free season ranges from 275 to 300 days. These variants are associated with Agua Dulce soils.

In a typical profile the surface layer is grayish-brown loam about 6 inches thick. Below is brown clay loam underlain by yellowish-brown gravelly clay loam at a depth of 38 inches.

These soils are used for range.

Ojai loam, thin surface variant, 30 to 50 percent slopes (OhF).--This is the only variant from the normal Ojai series mapped in the Area. It is on terraces.

Typical profile (in Los Angeles County; in Tapic Canyon along the maintenance road for the gas pipeline; NE1/4NE1/4 sec. 8, T. 4 N., R. 14 W.):

A11--0 to 2 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak, fine and medium, subangular blocky structure; slightly hard when dry, friable when moist, nonsticky and slightly plastic when wet; many micro roots and a few very fine and fine roots; common micro irregular pores and a few very fine tubular pores; about 5 percent, by volume, is fine gravel; slightly acid (pH 6.5); clear, smooth boundary; horizon 1 to 2 inches thick.

A12--2 to 6 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; hard when dry, friable when moist,

slightly sticky and slightly plastic when wet; many micro roots and a few very fine and fine roots; a few very fine tubular pores and common micro irregular pores; 10 percent, by volume, is gravel; slightly acid (pH 6.5); clear, smooth boundary; horizon 4 to 7 inches thick.

B1t--6 to 12 inches, brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate, medium and coarse, subangular blocky structure; hard to slightly hard when dry, friable when moist, slightly sticky and plastic when wet; common micro roots and a few very fine and medium roots; common micro irregular and tubular pores; many thin clay films in pores and as bridges; about 10 percent, by volume, is gravel, and 3 to 5 percent is cobblestones; slightly acid (pH 6.5); clear, smooth boundary; horizon 2 to 6 inches thick.

B2t--12 to 27 inches, brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate, medium and coarse, angular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; a few micro fine roots; a few micro irregular pores and a few fine tubular pores; many thin clay films in pores and as bridges and a few moderately thick clay films in pores, as bridges, and on ped faces; about 15 percent is gravel and 5 percent is cobblestones; slightly acid (pH 6.5); gradual, smooth boundary; horizon 10 to 15 inches thick.

B3t--27 to 38 inches, brown (10YR 5/3) clay loam, brown (10YR 5/3) moist; weak, fine and medium, subangular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; a few micro roots; many thin clay films and a few moderately thick clay films as bridges and in pores; 10 percent is gravel and 3 to 5 percent is cobblestones; slightly acid (pH 6.3); gradual, smooth boundary; horizon 6 to 9 inches thick.

C--38 to 50 inches, yellowish-brown (10YR 5/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; massive; hard when dry, firm when moist, sticky and plastic when wet; no roots; a few very fine tubular pores and micro irregular pores; 15 to 35 percent is gravel and 5 percent is cobblestones; mildly alkaline (pH 7.8); strongly effervescent; disseminated lime.

Structure of the A horizon is subangular blocky, or the soil is massive. Gravel and cobblestones cover about 1 to 2 percent of the surface. An A3 horizon is present in places. It is light clay loam and has a few thin clay films in pores. The B2t horizon is brown or dark brown in color and is about 10 to 15 percent gravel. From 15 to 35 percent of the C horizon is gravel, and 5 percent is cobblestones. In many places calcareous seams occur between fracture joints. Slopes commonly range from 35 to 45 percent.

Permeability is moderately slow in this soil. Runoff is rapid, and the hazard of erosion is high. Available water holding capacity is 8.0 to 10.0 inches. Fertility is low.

Included with this soil in mapping are some small areas of Agua Dulce stony loam.

Ojai loam, thin surface variant, 30 to 50 percent slopes is used only for range. Capability unit VIIe-1; (19) dryland; range site 2.

Pond Series

The Pond series consists of moderately well drained soils that have formed in granitic alluvium. These soils are in valley troughs or basins. Slopes are 0 to 2 percent. The vegetation is fourwing saltbush, alkali sacaton, iodine bush, alkali blite, saltgrass, and annual grasses and forbs. Elevations range from 2,310 to about 2,350 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is 62° F., and the frost-free season ranges from 240 to 260 days. Pond soils are associated with Oban and Tray soils.

In a typical profile the surface layer is light brownish-gray loam about 4 inches thick. Below is light brownish-gray clay loam about 20 inches thick, underlain by light-gray, white, and light brownish-gray silt loam and light clay loam. The soils are moderately to strongly affected by salts and alkali.

Pond soils are used as range in spring and as wildlife habitat. They also provide sites for poultry ranches and for industries.

Pond loam (Po).--This nearly level soil is in valley troughs. The areas are north of Lancaster and extend towards Rosamond Lake.

Typical profile (pit is 40 feet east of dirt road that is 0.45 mile south of Avenue I and 0.25 mile west of 30th Street West; SE1/4NE1/4 sec. 18, T. 7 N., R. 12 W.):

A1--0 to 4 inches, light brownish-gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; moderate, medium, granular structure; slightly hard when dry, very friable when moist, nonsticky and slightly plastic when wet; common micro roots and a few fine and medium roots; common micro irregular pores and a few very fine tubular pores; violently effervescent; disseminated lime; moderately alkaline (pH 8.4); clear, smooth boundary; horizon 4 to 12 inches thick.

B21t--4 to 17 inches, light brownish-gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; strong, medium and coarse, angular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; common very fine roots and a few micro and medium roots; a few very fine and fine tubular pores; many moderately thick clay films on ped faces and a few moderately thick clay films in pores; violently effervescent; disseminated lime; very strongly alkaline

(pH 9.2); clear, smooth boundary; horizon 10 to 14 inches thick.

B22t--17 to 24 inches, light brownish-gray (10YR 6/2) clay loam, grayish brown (10YR 5/2) moist; moderate, coarse, angular blocky structure; hard when dry, friable when moist, slightly sticky and plastic when wet; common micro and very fine roots; many very fine and fine tubular pores; continuous thin clay films on ped faces and a few moderately thick clay films in some pores; strongly effervescent; disseminated lime; very strongly alkaline (pH 9.4); gradual, smooth boundary; horizon 5 to 8 inches thick.

C1--24 to 44 inches, light-gray (10YR 6/1) silt loam, light gray (10YR 6/1) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro and very fine roots; a few very fine tubular pores; strongly effervescent; disseminated lime; very strongly alkaline (pH 9.4); gradual, smooth boundary; horizon 18 to 22 inches thick.

C2ca--44 to 66 inches, white (2.5Y 8/2) silt loam, white (2.5Y 8/2) moist; moderate, fine and very fine, subangular blocky structure; hard when dry, firm when moist, slightly sticky and plastic when wet; a few micro roots; a few very fine tubular pores; segregated lime in soft masses gives matrix a mottled appearance; violently effervescent; disseminated lime; moderately alkaline (pH 8.2); gradual, irregular boundary; horizon 20 to 24 inches thick.

C3--66 to 72 inches, light brownish-gray (10YR 6/2) light clay loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; a few micro and very fine tubular pores; common, medium, distinct, light yellowish-brown (10YR 6/4) mottles; violently effervescent; disseminated lime; moderately alkaline (pH 8.4).

The A1 horizon ranges from light brownish gray to pale brown and light yellowish brown or yellowish brown. Structure ranges from granular to blocky, and in places the soil is massive. The Bt horizon is light brownish gray, grayish brown, or light olive brown in color. It is clay loam or silty clay loam in texture. The content of clay generally is less than 35 percent. The C horizon generally ranges from light gray to very pale brown in color, but in a few places the lower part is white, light olive gray, or olive gray. Texture generally ranges from silt loam to clay loam or silty clay loam, though in places the lower part of the C horizon is gravelly loamy sand and loamy coarse sand. In many places the C horizon contains discontinuous plates that are cemented with lime and are 1/8 to 1/4 inch thick. Lime carbonates generally are disseminated throughout the profile and occur in concretions or in segregated filaments, seams, or soft masses.

Permeability is moderately slow in this soil. Available water holding capacity is 9.0 to 11.0 inches. Fertility is very low. Runoff is very slow, and the hazard of water erosion is slight. The high content of sodium in the B2t horizon may restrict root penetration of most cultivated crops.

Included with this soil in mapping are small areas of Tray sandy loam, saline-alkali, and of Pond-Oban complex. In areas of these included soils between 40th and 50th Streets West and Avenue I, the Pond soil has a dark-gray surface layer and is less alkaline than the typical Pond soil. Other included areas consist of patches of sandy loam laid down by wind over much of the valley troughs.

Pond loam contains harmful amounts of soluble salts and exchangeable sodium that are distributed in the profile so that they interfere with the growth of most crop plants. Reclamation at this time is not generally considered feasible because of the high cost of leaching water and because permeability of the subsoil is moderately slow.

This soil is used for range in spring and as wildlife habitat. A few poultry ranches and industrial sites are on areas of this soil. Capability unit VIIs-6 (30) dryland; range site 6.

Pond silty clay loam (Ps).--Except that the surface layer is silty clay loam and the subsoil is somewhat finer textured, this soil is similar to Pond loam. Also the upper 1/4 to 1/2 inch of this soil has many vesicular pores. In addition the surface layer is strongly alkaline to very strongly alkaline.

On this soil runoff is very slow or the water is ponded. The hazard of water erosion is slight. Available water holding capacity is 9.5 to 11.5 inches.

Included with this soil in mapping are many areas, 5 to 10 acres in size, where sandy loam and fine sandy loam material has been laid down by wind at the base of desert shrubs.

Pond silty clay loam is used for range and as wildlife habitat. Capability unit VIIs-6 (30) dryland; range site 6.

Pond-Oban complex (Px).--This complex is in basins in areas that are north of Lancaster and extend to Rosamond Lake. It generally is 30 percent Pond fine sandy loam, 20 percent Pond silty clay loam, and 30 percent Oban fine sandy loam. It also contains tracts of Tray loam that make up about 20 percent of each area. The proportion of each soil in the complex varies somewhat from area to area.

The soils in this complex are moderately well drained. Pond fine sandy loam occupies the slightly higher, hummocky areas of the basin floor. On this soil the vegetation is mainly fourwing saltbush, but saltgrass and Mormon tea grow on the higher hummocks. Pond silty clay loam is in depressions, and these areas have little vegetation on them other than alkali blite, alkali sacaton, and iodine bush. Oban fine sandy loam occupies similar but somewhat higher areas than Pond fine sandy loam. Tray loam contains a few thin lenses of indurated lime, but it otherwise is like other Tray soils mapped in the survey area. It occupies somewhat higher positions than

the other soils in the complex and formed in more permeable material.

The hazard of soil blowing is moderate on soils in this complex. Available water holding capacity is 7.5 to 11.5 inches. Permeability is slow or moderately slow. All of the soils contain lenses of material cemented with lime and silica, and their subsoil is moderately fine textured. The substratum is permeable in only very small areas. The soils are high in soluble salts and exchangeable sodium.

Included with this complex in mapping are small areas of Pond loam and of Tray sandy loam, saline-alkali.

This complex is poorly suited to any kind of land reclamation. Capability unit VIIs-6 (30) dryland; range site 6.

Ramona Series

In the Ramona series are well-drained soils that have formed in granitic alluvium. These soils are on terraces that are undulating in many places. Slopes range from 0 to 30 percent. The vegetation is mainly annual grasses and forbs, but clumps of California juniper are scattered over the areas. Elevations range from 2,750 to 3,900 feet. Average annual precipitation ranges from 9 to 12 inches, average annual temperature is 62° F., and the frost-free season ranges from about 210 to 240 days. Ramona soils are associated with Greenfield and Hanford soils.

The surface layer in a typical profile is brown coarse sandy loam and sandy loam about 20 inches thick. The subsoil is brown loam, sandy clay loam, and heavy loam about 44 inches thick. Just below is brown loam that generally is stratified and in many places is variable in texture.

These soils are used for irrigated crops and for dryland small grains, orchards, and range. The areas also provide habitat for wildlife.

Ramona coarse sandy loam, 5 to 9 percent slopes (RcC).--This soil is on terraces near Fairmont.

Typical profile (0.1 mile east of the intersection of Johnson Road and 110th Street West and 36 feet west of the farm road; SW1/4SW1/4 sec. 25, R. 14 W., T. 7 N.):

Ap--0 to 4 inches, brown (10YR 5/3) coarse sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, very friable when moist, nonsticky and nonplastic when wet; many micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.1); abrupt, smooth boundary; horizon 4 to 6 inches thick.

A1--4 to 20 inches, brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; massive: hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few micro and very fine tubular pores; slightly acid (pH 6.2); clear, smooth boundary; horizon 8 to 16 inches thick.

B1t--20 to 31 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; weak, medium, angular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; a few very fine and fine tubular pores; a few thin clay films on mineral grains and in tubular pores; slightly acid (pH 6.5); gradual, smooth boundary; horizon 8 to 14 inches thick.

B2t--31 to 51 inches, brown (7.5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; weak, coarse, angular blocky structure; hard when dry, firm when moist, slightly sticky and plastic when wet; a few micro roots; a few very fine tubular pores; many moderately thick clay films on ped faces and common moderately thick clay films in tubular pores; neutral (pH 7.0); gradual, smooth boundary; horizon 16 to 24 inches thick.

B3t--51 to 64 inches, brown (7.5YR 5/4) heavy loam, reddish brown (5YR 4/4) moist; weak, coarse, angular blocky structure; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; a few very fine tubular pores; many moderately thick clay films in tubular pores; neutral (pH 7.0); gradual, smooth boundary; horizon 9 to 17 inches thick.

C--64 to 90 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; massive; slightly hard when dry, firm when moist, nonsticky and nonplastic when wet; a few very fine tubular pores; neutral (pH 7.0).

The A horizon ranges from brown to pale brown or light brown in color. Reaction is neutral to slightly acid. The Bt horizon ranges from brown to reddish brown in color. Texture is clay loam, sandy clay loam, or heavy loam. Structure is medium to coarse angular blocky or is weak prismatic. Reaction ranges from slightly acid to neutral. The C horizon is loam or gravelly loam in texture. Below the A horizon the content of gravel is as much as 15 percent, by volume, in some places.

Permeability is moderately slow in this soil. Available water holding capacity is 8 to 10 inches. Fertility is moderate, runoff is slow to medium, and the hazard of erosion is slight to moderate. Roots can penetrate to a depth of 60 inches. Rainfall is unreliable and is likely to deviate widely from the average.

Included with this soil in mapping are small areas of Greenfield sandy loam and of Hanford coarse sandy loam. Also included are some areas that have a surface layer of sandy loam. Other included small areas are on high terraces in Leona Valley and in areas near Vincent and Acton. These areas consist of a strongly sloping unnamed soil that has a subsoil of reddish-brown clay and an abrupt AB boundary.

This Ramona soil is used for dryland crops and range, for dryland and irrigated orchards, and for wildlife habitat. Capability unit IIIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Ramona coarse sandy loam, 0 to 2 percent slopes (RcA).--In areas of this soil, slopes generally are less than 1 1/2 percent. The hazard of soil blowing is slight to moderate. Runoff is very slow, and the hazard of water erosion is none to slight.

Included with this soil in mapping are small areas that have a surface layer of sandy loam and loam. Also included are small areas of Greenfield sandy loam and of Hanford coarse sandy loam.

This Ramona soil is used for dryland small grains, alfalfa, and range. Capability unit I-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Ramona coarse sandy loam, 2 to 5 percent slopes (RcB).--This soil is on long, broad, smooth terraces near Fairmont. Soil blowing is a slight to moderate hazard. Runoff is slow, and the hazard of water erosion is slight.

Included with this soil in mapping are some areas that have a surface layer of sandy loam. Also included are some areas at the upper edge of the terraces that have a few pebbles and cobblestones on the surface. Other included small areas consist of Greenfield sandy loam; of Hanford coarse sandy loam; and of Ramona coarse sandy loam, 5 to 9 percent slopes.

This Ramona soil is used the same as Ramona coarse sandy loam, 5 to 9 percent slopes. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Ramona coarse sandy loam, 9 to 15 percent slopes (RcD).--This soil is on terraces in Fairmont and Leona Valleys. In many places the topography is rolling. Soil blowing is a slight to moderate hazard. Runoff is medium, and the hazard of water erosion is moderate.

Included with this soil in mapping are small areas that have patches of gravel and cobblestones on the surface. Also included are small areas of Greenfield sandy loam, of Hanford coarse sandy loam, and of Terrace escarpments. In other included small areas, sheet and rill erosion are moderate.

This Ramona soil is used for dryland small grains and range. Because rainfall is unreliable, growth of dryland crops is poor. Capability unit IVe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Ramona sandy loam, 9 to 30 percent slopes, eroded (RdE2).--This soil formed in old granitic alluvium laid down in a series of fairly narrow fingerlike ridges that face to the northeast in many places. The areas are northwest of Neenach and the topography is complex and hilly. The surface layer of this soil is brown, massive sandy loam about 12 inches thick. On the ridgetops the soil is gently sloping, is stony in many small areas, and is slightly eroded. On the sides of the ridges, the soil is moderately eroded and the dominant slope is about 25 percent. Drainageways of many intermittent streams dissect the terraces.

Runoff is medium to rapid on this soil, and the hazard of erosion is moderate to high.

Included with this soil in mapping are a few deep gullies and many shallow gullies. Also included are a few severely eroded areas less than 5 acres in size. Other included small areas consist of Vernalis loam, which occupies many long narrow areas between the ridges and makes up about 5 percent of the mapping unit.

This Ramona soil is used for range, wildlife habitat, and watershed. Capability unit VIe-1 (19) dryland; range site 2.

Ramona gravelly sandy loam, 2 to 9 percent slopes (ReC).--This soil is on terraces. Slopes are variable, but they range from 5 to 9 percent in most places. The surface layer is brown, massive gravelly sandy loam about 12 inches thick. Gravel and cobblestones occur throughout the profile. Their content, by volume, ranges from 15 to 30 percent.

Runoff is slow to medium on this soil, and the hazard of erosion is slight to moderate. Because of the content of gravel and cobblestones in the soil, the amount of water held in the soil is low. The gravel and stones also are likely to interfere with tillage. Available water holding capacity is 5.5 to 7.5 inches.

Included with this soil in mapping are small areas that have slopes of 10 to 14 percent. Also included are small areas on terraces of the southern Tehachapi Range, east of Cottonwood Creek. Here the parent material came from granitic rock and such other rocks as schist, diorite, gabbro, and limestone. As a result, the soil in these included areas is reddish brown. Also, elevations range between 4,200 and 4,800 feet and average annual temperature is less than 59° F. Other included areas consist of Ramona coarse sandy loam, 5 to 9 percent slopes, and of areas, 20 to 40 acres in size, where sheet and rill erosion are moderate. Still other included areas are along low rolling foothills east of Gorman on the Tejon Ranch, west of the old Neenach School. Here the parent material is old granitic alluvium that overlies uptilted, nearly vertical strata of such sedimentary rocks as sandstone conglomerate and shale. These included areas consist of outcrops of rock and make up as much as 10 percent of the mapped area.

This Ramona soil is used for dryland small grains, for range, and for wildlife. Capability unit IIIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Ramona gravelly sandy loam, 9 to 30 percent slopes (ReE).--This soil is north and northwest of Neenach. The surface layer is brown, massive gravelly sandy loam that is slightly acid and is about 12 inches thick. Slopes generally are convex and complex and range from 10 to 25 percent. Throughout the profile the content of gravel ranges from 20 to 35 percent, by volume. Available water holding capacity is 5.5 to 7.5 inches. Runoff is medium

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to rapid, and the hazard of erosion is moderate to high.

Included with this soil in mapping are a few areas, 10 to 20 acres in size, that have cobblestones and other stones on the surface.

This Ramona soil is used only for range and wildlife habitat. Capability unit VIe-1 (19) dryland; range site 2.

Ramona loam, 2 to 5 percent slopes (RfB).--This soil has a surface layer of massive loam about 12 to 14 inches thick, but it is otherwise similar to Ramona coarse sandy loam, 5 to 9 percent slopes. Runoff is slow, and the hazard of erosion is slight.

Included with this soil in mapping are about 175 acres of an unnamed soil on high convex terraces, west of Castaic. This included soil has a surface layer of light yellowish-brown to brown or yellowish-brown, massive loam that is slightly acid and is about 10 to 14 inches thick. The subsoil is yellowish-brown, blocky loam or light clay loam that is neutral and is about 18 to 22 inches thick. Below is yellowish-brown, weak blocky loam that is 5 to 10 percent gravel and cobblestones.

This Ramona soil is used for dryland small grains. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Ramona loam, 5 to 9 percent slopes (RfC).--This soil occupies scattered areas near Fairmont. The surface layer is massive loam about 12 to 14 inches thick, but the soil is otherwise similar to Ramona coarse sandy loam, 5 to 9 percent slopes. Runoff is slow to medium, and the hazard of erosion is slight to moderate.

Included with this soil in mapping are small areas of a soil like the included soil described under Ramona loam, 2 to 5 percent slopes.

This Ramona soil is used for dryland crops and range, for dryland and irrigated orchards, and for wildlife habitat. Capability unit IIIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Riverwash

Riverwash (Rg) consists of sandy material in the beds of intermittent streams. Narrow stringers of gravelly sand occupy many of the areas. During each flood, fresh deposits of alluvium are laid down and removed as the result of streambank erosion. The hazard of soil blowing is slight to moderate. Little or no vegetation is on the areas.

This land type has no value for farming. The areas are used for wildlife and watershed purposes. Capability unit VIIIw-4 (19, 20, 30) dryland; range site not assigned.

Rock Land

Rock land (RhF) occurs throughout the survey area. It consists of strongly sloping to steep mountains and smaller hills where the soil material is very shallow and outcrops of rock cover 50 to 90 percent of the mapped area. The outcrops consist mainly of granitic rock and volcanic flow material, but some limestone is on the southern flanks of the Tehachapi Mountains. The vegetation varies with elevation of the areas. On the mountainous areas the cover is brush or sparse grass. Here runoff is very rapid. On the desert floor, where elevations are lower, the areas generally are barren or have a few desert shrubs on them. The undercover is annual grasses and forbs and remnants of desert stipa.

Rock land has little value for farming. It is used for watershed, for wildlife habitat, or for its scenic value. Capability unit VIIIs-1 (19, 20, 30); range site not assigned.

Rosamond Series

The Rosamond series consists of moderately well drained soils that have formed in granitic alluvium. These soils are on low alluvial fans. Slopes range from 0 to 2 percent. Sagebrush and rabbitbrush and a thin understory of annual grasses and forbs make up the vegetation. Elevations range from 2,400 to 2,900 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is about 62° F., and the frost-free season ranges from 240 to 260 days. Rosamond soils are associated with Cajon and Hesperia soils.

In a typical profile the surface layer is light brownish-gray, mildly alkaline and moderately alkaline fine sandy loam and very fine sandy loam about 8 inches thick. Below is pale-brown light silty clay loam and light sandy clay loam underlain by light brownish-gray loam at a depth of 34 inches. Pale-brown light silty clay loam is at a depth of 48 inches. A saline-alkali surface layer occurs in places, and some areas are hummocky.

These soils are used for irrigated crops (see pl. II), for pasture, and for range.

Rosamond fine sandy loam (Ro).--This soil is on alluvial fans near Roosevelt.

Typical profile (SW1/4SW1/4 sec. 33, T. 8 N., R. 10 W.):

C1--0 to 4 inches, light brownish-gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak, medium and thick platy structure; slightly hard when dry, very friable when moist, nonsticky and slightly plastic when wet; common very fine and a few fine roots; many very fine irregular pores and a few fine tubular pores; mildly alkaline (pH 7.8); abrupt, smooth boundary; horizon 4 to 12 inches thick.

C2--4 to 8 inches, light brownish-gray (10YR 6/2) very fine sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; a few fine roots; many very fine irregular pores and tubular pores and a few fine tubular pores; slightly

effervescent; disseminated lime; moderately alkaline (pH 7.9); clear, smooth boundary; horizon 4 to 6 inches thick.

C3--8 to 28 inches, pale-brown (10YR 6/3) light silty clay loam, dark brown (10YR 4/3) moist; weak, medium, angular blocky structure; hard when dry, friable when moist, sticky and plastic when wet; a few fine medium and coarse roots; many very fine irregular and tubular pores and a few fine tubular pores; strongly effervescent; disseminated lime and a few, soft, rounded concretions of lime; moderately alkaline (pH 8.2); clear, wavy boundary; horizon 18 to 24 inches thick.

C4--28 to 34 inches, pale-brown (10YR 6/3) light sandy clay loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, sticky and plastic when wet; a few very fine and medium roots; many very fine irregular pores and a few fine and very fine tubular pores; horizon is not clearly continuous; slightly effervescent; disseminated lime and a few fine filaments of lime; moderately alkaline (pH 8.2); clear, wavy boundary; horizon 3 to 9 inches thick.

C5--34 to 48 inches, light brownish-gray (10YR 6/2) loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, sticky and plastic when wet; a few very fine and medium roots; many very fine irregular pores and a few fine and medium tubular pores; several discontinuous lenses of sand that are 1/2 to 1 inch thick; strongly effervescent; disseminated lime; a few, soft, rounded masses of lime; moderately alkaline (pH 8.2); clear, wavy boundary; horizon 12 to 16 inches thick.

C6--48 to 61 inches, pale-brown (10YR 6/3) light silty clay loam, dark brown (10YR 4/3) moist; weak, medium, angular blocky structure; very hard when dry, firm when moist, sticky and plastic when wet; a few fine roots; a few very fine irregular pores, many very fine tubular pores, and a few fine and medium tubular pores; violently effervescent; disseminated lime in common, irregular, soft masses; moderately alkaline (pH 8.2).

The C1 and C2 horizons are brown, light brownish gray, pale brown, pinkish gray, light brown, or strong brown in color. Texture ranges from fine sandy loam to silty clay loam. Structure is platy, or the soil is massive. The C3, C4, C5, and C6 horizons are pale brown or light brownish gray in color. Texture is light silty clay loam, light sandy clay loam, loam, and clay loam. The profile generally is calcareous and is mildly alkaline to moderately alkaline throughout. Thin strata of sandy loam or loamy sand are common below a depth of 40 inches. Soft masses of lime and hard, small concretions of lime generally are in the lower part of the C horizon.

Permeability is moderate in this soil. Available water holding capacity is 9.5 to 11.0 inches. Fertility is moderate. Soil blowing is a moderate hazard. Runoff is very slow, and the hazard of water erosion is slight. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are some areas that contain a few thin clay films as bridges. These clay films suggest a weak B horizon that may occur high in the profile or may be buried at any depth. Also included are small areas of Hesperia fine sandy loam and of soils that have a surface layer of sandy loam or of loamy fine sand. Other included areas have a slight accumulation of salts. These saline areas make up about 10 percent of the total mapped acreage. They have a cover of saltbush, saltgrass, and other vegetation that tolerate saline-alkali soil and have never been irrigated.

Rosamond fine sandy loam is used for irrigated crops, for range, and as wildlife habitat. Capability unit IIe-1 (30) irrigated, VIIe-1 (30) dryland; range site 7.

Rosamond loamy fine sand (Rm).--This soil is near Lancaster. The surface layer is soft, light brownish-gray loamy fine sand. It ranges from 10 to 16 inches in thickness and from massive to platy in structure.

Soil blowing is a moderate hazard on this soil. In many areas seedlings of row crops are damaged by the wind. Available water holding capacity is 9.0 to 10.5 inches.

Included with this soil in mapping are small areas of Cajon loamy sand and of Hesperia loamy fine sand. Also included are small areas of a sandy loam soil.

Rosamond loamy fine sand is used for alfalfa and pasture. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Rosamond loamy fine sand, hummocky (Rm2).--This soil is east of Lancaster. It consists of loamy fine sand that has been piled into hummocks by wind. The hummocks occur in a fine pattern and are 12 to nearly 36 inches high. The hazard of soil blowing is high. Available water holding capacity is 9.0 to 10.0 inches.

Included with this soil in mapping are small areas that have a surface layer of fine sand. Also included are a few areas that have low sand dunes on them. Other included small areas consist of Cajon loamy fine sand and Hesperia loamy fine sand.

Rosamond loamy fine sand, hummocky, is used only for grazing in spring. Capability unit IIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 8.

Rosamond loam (Rp).--This soil occupies large uniform areas near Roosevelt, east of Lancaster. The surface layer is massive loam about 6 to 8 inches thick. Slopes typically are less than 1 percent. In places the surface layer ranges from very fine sandy loam to silt loam.

Runoff is very slow on this soil, and the hazard of water erosion is slight. Available water holding capacity is 10.0 to 11.5 inches.

Included with this soil in mapping are small

areas that have a pinkish-gray surface layer. Also included are small undulating areas, near 190th Street East, that have a slope of 2 percent. Other included small areas consist of Cajon loamy sand, of Hesperia sandy loam, and of Hesperia loam. Still other included areas, 1 to 5 acres in size, consist of scattered tracts of saline-alkali soil.

Rosamond loam is used for irrigated crops, for range, and as wildlife habitat. Capability unit I-1 (30) irrigated, VIIc-1 (30) dryland; range site 7.

Rosamond loam, saline-alkali (Rr).--This soil has a surface layer of light brownish-gray loam that is about 10 to 12 inches thick. The content of saline-alkali generally is slight to moderate.

On this soil runoff is very slow, and the hazard of water erosion is slight. Fertility is low.

Included with this soil in mapping are small areas of Pond loam. Also included are small areas of Rosamond silty clay loam, saline-alkali, and of Tray sandy loam, saline-alkali. In some small included areas the content of exchangeable sodium is high, and in others, the content of soluble salts is high.

Rosamond loam, saline-alkali, is used only for limited range in spring. Capability unit IIIs-6 (30) irrigated, VIIs-6 (30) dryland; range site 6.

Rosamond loam, sandy loam substratum (Rs).--In this soil sandy loam or coarse loamy sand occurs at a depth of about 40 to 48 inches. As a result the available water holding capacity is somewhat less than in Rosamond fine sandy loam. Available water holding capacity is 7.5 to 8.5 inches. Runoff is very slow, and the hazard of water erosion is slight.

Included with this soil in mapping are about 40 acres of soil underlain by pea-sized gravel and coarse sand at a depth below 30 inches. This area is southwest of the intersection of 20th Street East and Avenue H. Also included are small areas of Rosamond loam. Other included small areas are not irrigated and generally are saline.

Rosamond loam, sandy loam substratum, is used for all commonly grown irrigated row crops. It also is used for alfalfa, pasture, and range. Capability unit I-1 (30) irrigated, VIIc-1 (30) dryland; range site 7.

Rosamond silty clay loam (Rt).--This soil has a surface layer of pale-brown silty clay loam about 12 inches thick. Runoff is very slow, and the hazard of water erosion is slight. Available water holding capacity is 11.0 to 12.0 inches.

Included with this soil in mapping are small slick spots that occupy about 5 percent of the mapped area. Also included are small areas that have a surface layer of loam.

Rosamond silty clay loam is used for most row crops grown in the survey area. It also is used for alfalfa, pasture, and range. Capability unit I-1 (30) irrigated, VIIc-1 (30) dryland; range site 7.

Rosamond silty clay loam, saline-alkali (Ru).--Most areas of this soil are adjacent to Pond and Tray soils. The surface layer is pale-brown silty clay loam. It is about 10 to 12 inches thick and is slightly to moderately affected by soluble salts and exchangeable sodium. The saline-alkali content varies, but more than 80 percent of the mapped area is at least slightly saline-alkali.

Runoff is very slow on this soil, and the hazard of water erosion is slight. Fertility is low. Available water holding capacity is 11.0 to 12.0 inches.

Included with this soil in mapping are small areas that are moderately and severely saline. Also included are small areas of soil in which the content of exchangeable sodium is high. Other included small areas consist of Pond loam and of Tray sandy loam, saline-alkali.

This Rosamond soil is used only as range in spring. Capability unit IIIs-6 (30) irrigated, VIIs-6 (30) dryland; range site 6.

Rough Broken Land

Rough broken land (RzF) consists of areas of uplifted sediment cut by many intermittent drainageways. Most of the areas are on terraces about one-half mile west of the West Antelope Aqueduct Station on Cottonwood Creek. Small areas are along the eastern part of the San Andreas Fault Zone near Little Rock Creek and Big Rock Creek. Narrow V-shaped valleys and sharp divides mark the areas. Slopes range from 15 to 50 percent. The vegetation is scanty and consists of shrubs that have an understory of annual grasses and forbs.

Runoff is very rapid on this land type, and the hazard of erosion is very high. During each rainstorm large amounts of silt are washed onto lower lying soils. Geologic erosion is active, and in many places soil slipping is common.

Included with this land type in mapping are a few small areas of Gullied land. Also included, and making up about 10 percent of the mapped area, are areas on soft shale, sandstone, and conglomerate that have little vegetation on them.

Rough broken land is used mainly as watershed and as wildlife habitat. Capability unit VIIIe-1 (19, 20, 30) dryland; range site not assigned.

Sandy Alluvial Land

Sandy alluvial land (Sa) is mostly on flood plains along the Santa Clara River and its larger tributaries. It consists of unconsolidated alluvium that generally is stratified and ranges from sand to loamy sand in texture. The soil material has recently been deposited by streams. Flooding is frequent, and during each flood resorting of the soil material occurs. The plant cover is willows and cottonwoods that have an understory of annual grasses and forbs. Soil blowing is a moderate hazard.

This land type is used for grazing, for wildlife habitat, and for watershed purposes. Frequent flooding severely limits use for cultivated crops. Protection from flooding is needed. Capability unit VIIw-4 (19, 20, 30); range site 3.

Saugus Series

Soils of the Saugus series are well drained and are on uplands. They formed on weakly consolidated sediment that contained pebbles and cobblestones in some places. Slopes range from 15 to 50 percent. The vegetation consists of dense stands of chamise and candlestick yucca that have an understory of annual grasses, forbs, and remnant stands of perennial grasses. Elevations range from 1,300 to 2,250 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 63° F., and the frost-free season ranges from about 275 to 300 days. Saugus soils are associated with Balcom, Castaic, and Gazos soils.

In a typical profile the surface layer is grayish-brown loam about 15 inches thick. Below is grayish-brown loam underlain by weakly consolidated sediment at a depth of 42 inches.

These soils are used for range and for homesites. They also are used for wildlife and watershed purposes.

Saugus loam, 30 to 50 percent slopes, eroded (ScF2).--This soil is on uplands in Romero Canyon and in other places near Castaic Junction.

Typical profile (1.4 miles north of the steel gate at the Zereb Arabian Horse Ranch; NW1/4NW1/4 sec. 27, T. 5 N., R. 17 W.):

A1--0 to 15 inches, grayish-brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; weak, fine, subangular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots and common very fine, medium, and coarse roots; common very fine tubular pores, a few fine tubular pores, and a few micro irregular pores; about 5 percent is gravel, by volume; neutral (pH 6.8); gradual, smooth boundary; horizon 8 to 17 inches thick.

C1--15 to 25 inches, grayish-brown (10YR 5/2) loam, grayish brown (10YR 4/2) moist; weak, medium, subangular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro and very fine roots and common coarse roots; a few micro and very fine tubular pores and common micro irregular pores; about 15 percent is gravel, by volume; slightly acid (pH 6.5); gradual, smooth boundary; horizon 10 to 14 inches thick.

C2--25 to 42 inches, grayish-brown (10YR 5/2) loam, grayish brown (10YR 4/2) moist; weak, medium, subangular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots, common very fine roots, and a few coarse roots; a few very fine tubular pores and common micro irregular pores; about 10 percent is gravel, by volume; slightly acid (pH 6.5); diffuse, smooth boundary; horizon 16 to 25 inches thick.

C3--42 to 54 inches, grayish-brown (10YR 5/2) weakly consolidated sediment that crushes to gravelly sandy loam near loam, dark grayish brown (10YR 4/2) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few very fine and fine roots; a few very fine micro irregular pores; about 25 percent is gravel and 5 percent is cobblestones; slightly acid (pH 6.3).

Color of the A1 horizon is pale brown, grayish brown, or brown. Texture generally is loam, but some areas, 10 acres or less in size, are sandy loam and have sandstone strata close to the surface. Granitic pebbles, cobblestones, and a few other stones cover about 3 percent of the surface. The amount of gravel in the solum increases gradually with increasing depth, but it does not exceed 35 percent, by volume.

The C1 and C2 horizons are pale brown or grayish brown in color. Texture ranges from sandy loam to very fine sandy loam or loam. Reaction ranges from slightly acid to neutral. The C3 horizon consists of weakly consolidated sediment that is only slightly firmer than the soil material above but that restricts penetration of roots. The depth that plant roots can penetrate varies widely, depending upon the underlying geologic strata, but it typically is about 34 to 56 inches. Below this depth are tilted strata of very soft sandstone and shale that contain strata of rounded, waterworn granitic pebbles or cobblestones. The strata range from 1 to 3 feet or more in thickness. Also present are strata of hard sandstone or shale. These strata are thinner than the soft sandstone and shale, are discontinuous in many places, and make up only a small part of the underlying material. In many places effervescence is present in the fracture joints.

Permeability is moderate in this soil. Available water holding capacity is 5.0 to 7.5 inches. Fertility is low, runoff is rapid, and the hazard of erosion is high.

Included with this soil in mapping are small areas of Castaic-Balcom silty clay loams and of Castaic and Saugus soils. Also included are small areas of Gaviota rocky sandy loam and of Rough broken land.

This Saugus soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (19) dryland; range site 2.

Saugus loam, 15 to 30 percent slopes (ScE).--In most places this soil has slopes that range from 20 to 24 percent. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are small areas on toe slopes that have slopes of 5 to 15

percent. Also included are areas, 5 to 10 acres in size, where sheet and rill erosion are moderate. Other included small areas consist of Balcom silty clay loams and of Saugus loam, 30 to 50 percent slopes.

This Saugus soil is used mainly for range. Some areas are used for homesites and subdivisions, though much grading is required. Capability unit VIe-1 (19) dryland; range site 2.

Saugus loam, 30 to 50 percent slopes (ScF).--In most places the slope of this soil is about 45 percent, though on north slopes the slope may be as steep as 55 percent. Runoff is rapid, and the hazard of erosion is high.

Included with this soil in mapping are small areas of Castaic-Balcom silty clay loams, 30 to 50 percent slopes, and of Castaic and Saugus soils, 30 to 65 percent slopes, eroded. Also included are small areas cut by sheet and gully erosion.

This Saugus soil is used mainly for range. Many areas, however, have been reshaped and graded by earthmoving equipment for use as homesites and subdivisions. Capability unit VIIe-1 (19) dryland; range site 2.

Sheridan Series

The Sheridan series consists of well-drained soils that formed in material weathered from granitic rock. These soils are in mountainous areas. Slopes range from 15 to 50 percent. The vegetation consists of dense thickets of scrub oak that have an understory of annual grasses and forbs that includes some perennial grasses. Elevations range from 4,800 to 6,500 feet. Average annual precipitation ranges from 16 to 20 inches, average annual temperature is about 55° F., and the frost-free season ranges from about 180 to 210 days. Sheridan soils are associated with Anaverde, Gorman, and Lebec soils.

In a typical profile the surface layer is gray heavy sandy loam about 21 inches thick. Below is brown gravelly sandy loam about 11 inches thick underlain by hard, broken and shattered granitic rock.

These soils are used for range, wildlife habitat, and watershed.

Sheridan sandy loam, 30 to 50 percent slopes (ShF).--This soil is on mountainous areas near Woodchoppers Canyon.

Typical profile (on Tejon Ranch in Kern County, up Woodchoppers Canyon, about 2.0 miles northwest of the headquarters of the old Cluff Ranch):

A11--0 to 7 inches, gray (10YR 5/1) heavy sandy loam, very dark gray (10YR 3/1) moist; moderate, fine and medium, crumb structure; soft when dry, very friable when moist, nonsticky and nonplastic when wet; many micro and very fine roots, common very fine roots, and a few fine roots; many micro irregular pores; about 10 percent is fine gravel, by volume; slightly acid (pH 6.2); gradual, wavy boundary; horizon 6 to 9 inches thick.

A12--7 to 21 inches, gray (10YR 5/1) heavy sandy loam, very dark gray (10YR 3/1) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro and very fine roots and a few fine roots; many micro irregular pores, common very fine tubular pores, and a few fine tubular pores; about 10 to 12 percent is fine gravel; slightly acid (pH 6.2); gradual, wavy boundary; horizon 14 to 17 inches thick.

C--21 to 32 inches, brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro roots and a few very fine roots; common micro irregular pores; about 35 percent is gravel, by volume; slightly acid (pH 6.2); gradual, wavy boundary; horizon 0 to 12 inches thick.

R--32 inches, hard, broken and shattered granitic rock.

The A horizon ranges from gray or dark gray to grayish brown or dark brown in color. Texture ranges from heavy sandy loam or loam to coarse sandy loam or sandy loam. The soil has crumb structure, or it is massive. In many places an overwash of granitic gravel, 3/8 to 1/2 inch thick, is on the surface. In many places the A horizon rests directly on the parent rock. Reaction ranges from slightly acid to medium acid. The C horizon is discontinuous or is lacking in many places. It ranges from brown or grayish brown to yellowish brown or strong brown in color. Texture ranges from gravelly sandy loam to gravelly coarse sandy loam or gravelly loam. The content of gravel ranges from 15 to 35 percent, by volume.

Permeability of this soil is moderately rapid. Runoff is rapid, and the hazard of erosion is high. Fertility is moderate. Available water holding capacity is 3.5 to 5.0 inches. Depth to which plant roots can penetrate varies, but it typically is about 24 to 36 inches.

Included with this soil in mapping are small areas of Lebec rocky loam. Also included are outcrops of bedrock that occupy as much as 2 percent of the surface of the mapped area. Other included areas consist of unnamed soils that have a surface layer less than 20 inches thick or a very gravelly substratum. These unnamed soils make up 5 to 10 percent of the mapped area.

This Sheridan soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (20) dryland; range site 2.

Sheridan sandy loam, 15 to 30 percent slopes (ShE).--This soil is on foothills along the south slope of the Tehachapi Range. Many areas are hilly. In most places slopes range from 20 to 28 percent. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are small areas cut by sheet and rill erosion.

This Sheridan soil is used only for range and wildlife habitat. Capability unit VIe-1 (20) dryland; range site 2.

Sheridan sandy loam, 15 to 30 percent slopes, eroded (ShE2).--Moderate sheet and rill erosion have occurred in most areas of this soil. The areas are cut by many shallow gullies and by a few deep gullies. Slopes are about 25 percent in most places. Runoff is medium, and hazard of further erosion is moderate.

Included with this soil in mapping are small areas of soils that are not eroded.

This Sheridan soil is used for range and wildlife habitat. Capability unit VIe-1 (20) dryland; range site 2.

Sheridan sandy loam, 30 to 50 percent slopes, eroded (ShF2).--Moderate sheet and rill erosion have occurred in most areas of this soil. In most places the surface layer ranges from 20 to 22 inches in thickness. The areas are cut by a few shallow and deep gullies. Slopes range from 40 to 50 percent. Depth to bedrock ranges from about 24 to 30 inches in most places. Available water holding capacity is 2.5 to 3.5 inches.

Included with this soil in mapping are small areas that are not eroded.

This Sheridan soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (20) dryland; range site 2.

Soboba Series

The Soboba series consists of excessively drained soils that have formed in granitic alluvium. These soils are on alluvial fans. Slopes range from 2 to 5 percent. The vegetation is mainly annual grasses and forbs, but sagebrush, rabbitbrush, and willow and cottonwood trees grow along the stream channels. Elevations range from 3,500 to 3,700 feet. Average annual precipitation ranges from about 12 to 16 inches, average annual temperature is 61° F., and the frost-free season ranges from 210 to 240 days. Soboba soils are associated with Amargosa, Greenfield, and Hanford soils.

In a typical profile the surface layer is pale-brown cobbly very fine sandy loam about 3 inches thick. Below is pale-brown and light brownish-gray very cobbly loamy coarse sand that extends to a depth of 60 inches or more.

These soils are used for incidental grazing in spring, for wildlife habitat, and for recreational purposes.

Soboba cobbly loamy sand, 2 to 5 percent slopes (SoB).--This is the only Soboba soil mapped in the Area. It is on long, gently sloping alluvial fans along Valyermo Road.

Typical profile (on the east side of the Valyermo Road; 0.9 mile south of the junction of the Valyermo and Pallet Creek Roads; NE1/4NE1/4 sec. 7, T. 4 N., R. 9 W.):

C1--0 to 3 inches, pale-brown (10YR 6/3) cobbly very fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; a few micro irregular pores; by volume, 30 percent is cobblestones and pebbles; neutral (pH 7.0); abrupt, smooth boundary; horizon 3 to 6 inches thick.

C2--3 to 22 inches, pale-brown (10YR 6/3) very cobbly loamy coarse sand, light brownish gray (10YR 6/2) moist; single grain; loose when dry or moist and nonsticky and nonplastic when wet; a few very fine and fine roots; by volume, about 35 percent is pebbles and cobblestones, and about 10 percent of these are slightly effervescent on the bottom; neutral (pH 7.0); gradual, smooth boundary; horizon 18 to 22 inches thick.

C3--22 to 60 inches, light brownish-gray (10YR 6/2) very cobbly loamy coarse sand, grayish brown (10YR 5/2) moist; single grain; loose when dry or moist and nonsticky and nonplastic when wet; a few very fine and micro roots; by volume, about 40 percent is cobblestones and 15 percent is pebbles, and about 75 percent of these are slightly effervescent on the bottom; a few boulders are present; 1 to 5 layers of sandy loam that are 3/8 inch thick; slightly effervescent; disseminated lime; mildly alkaline (pH 7.5).

The C1 horizon ranges from cobbly loamy sand to cobbly very fine sandy loam in texture, but the dominant texture is cobbly loamy sand. Cobblestones occupy 20 to 30 percent of the surface layer. Reaction ranges from slightly acid to neutral. Effervescence on the bottom of the cobblestones and pebbles is none to very slight.

The C2 and C3 horizons range from light brownish gray to pale brown in color. Texture ranges from very cobbly loamy coarse sand to very gravelly loamy coarse sand. The cobblestones and pebbles make up 35 percent or more of the C2 and C3 horizons and fines fill the interstices. Reaction ranges from neutral to mildly alkaline. Effervescence is slight on the bottom of the cobblestones and pebbles, as well as in the lower part of the C3 horizon.

Permeability of this soil is very rapid. Fertility is very low. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is slight to moderate. Available water holding capacity is 2 to 3 inches. Roots can penetrate to a depth of 60 inches.

Included with this soil in mapping are small areas of Riverwash.

This soil is used for range, wildlife habitat, and recreation. Capability unit VIIs-4 (19) dryland; range site 3.

Sorrento Series

The Sorrento series consists of well-drained soils that have formed in mixed alluvium. These soils are on alluvial fans. Slopes are 0 to 5 percent. The plant cover is grasses and oaks. Elevations range from 1,175 to 1,250 feet. Average annual precipitation ranges from about 14 to 16 inches, average annual temperature is 63° F., and the frost-free season ranges from 275 to 300 days. Sorrento soils are associated with Metz, Mocho, and Yolo soils.

In a typical profile the surface layer is brown loam about 7 inches thick. The subsoil is also brown loam about 7 inches thick. Below is yellowish-brown and light yellowish-brown loam to a depth of 72 inches or more.

These soils are used for irrigated crops.

Sorrento loam, 2 to 5 percent slopes (SsB).--This soil is on long, smooth alluvial fans along drainageways of the Santa Clara River, near Castaic Junction.

Typical profile (90 feet south of State Highway 126; about 300 yards east of line marker for Ventura County; 2 feet west and 9 feet north of irrigation hydrant No. 24):

Ap--0 to 7 inches, brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate, fine and medium, subangular blocky structure; hard when dry, friable when moist, slightly sticky and plastic when wet; a few micro roots; common micro irregular pores and a few micro tubular pores; mildly alkaline (pH 7.8); abrupt, smooth boundary; horizon 7 to 14 inches thick.

B2--7 to 14 inches, brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, slightly sticky and plastic when wet; a few micro roots; common micro irregular pores and very fine tubular pores and a few fine tubular pores; many worm casts; moderately alkaline (pH 8.0); clear, smooth boundary; horizon 7 to 9 inches thick.

C1--14 to 40 inches, yellowish-brown (10YR 5/4) loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, slightly sticky and plastic when wet; a few micro roots; many micro irregular pores, common micro and very fine tubular pores, and a few fine tubular pores; a few worm casts; strongly effervescent; disseminated lime; moderately alkaline (pH 8.0); gradual, smooth boundary; horizon 23 to 28 inches thick.

C2--40 to 72 inches, light yellowish-brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive; hard when dry, friable when moist, slightly sticky and plastic when wet; a few micro roots; many micro irregular pores, common micro and very fine tubular pores, and a few medium tubular pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.2).

The A horizon ranges from brown to grayish brown in color. Texture ranges from fine sandy loam to loam. The soil is massive and hard when dry, though structure is blocky in intensively cultivated fields. Reaction is mildly alkaline or moderately alkaline. The B2 horizon is brown, dark brown, or strong brown in color. It ranges from very fine sandy loam to heavy loam in texture. The C horizon ranges from yellowish brown to pale brown or light yellowish brown in color. Texture is dominantly loam or very fine sandy loam, but a few very thin lenses of loamy sand or coarse sandy loam occur at a depth below 40 inches.

Permeability of this soil is moderate. Available water holding capacity is 8.5 to 10.0 inches. Fertility is high. Runoff is slow, and the hazard of erosion is slight. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Metz loamy sand, of Mocho loam, and of Yolo loam. Also included are small areas that have a surface layer of sandy loam.

This Sorrento soil is used for such irrigated crops as alfalfa, green onions, carrots, walnuts, and pasture. Capability unit IIe-1 (19) irrigated; range site not assigned.

Sorrento loam, 0 to 2 percent slopes (SsA).--This soil is on alluvial fans along the Santa Clara River and its major tributaries. Runoff is very slow, and the hazard of erosion is slight.

Included with this soil in mapping are small areas that have a surface layer of sandy loam. Also included are small areas of Metz loamy sand, of Mocho loam, and of Yolo loam.

This Sorrento soil is used for many kinds of irrigated crops. Capability unit I-1 (19) irrigated; range site not assigned.

Sunrise Series

In the Sunrise series are moderately well drained soils that have formed in granitic alluvium from valley fill. These soils occupy areas on the basin rim. Slopes are 0 to 2 percent. The vegetation is chiefly fourwing saltbush, rabbitbrush, and annual grasses and forbs, but sagebrush grows in some places. Elevations range from 2,400 to 2,450 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is 62° F., and the frost-free season ranges from 240 to 260 days. Sunrise soils are associated with Merrill and Tray soils.

Typically the surface layer is very pale brown and light yellowish brown sandy loam and fine sandy loam about 19 inches thick. Below is pale-yellow heavy loam about 12 inches thick. A pan of weakly cemented white caliche is at a depth of about 31 inches. In some places the surface layer is loamy fine sand, and in others it is loam. Some areas that have a surface layer of loam are saline-alkali. Depth to the caliche ranges from 10 to 39 inches.

These soils are used for irrigated crops, for range, and for wildlife habitat.

Sunrise sandy loam (Sv).--This soil is in Kern County. Typical profile (0.3 mile east of 100th Street West and 150 feet north of an unimproved road; NE1/4SW1/4 sec. 19, T. 9 N., R. 13 W.):

A11--0 to 8 inches, very pale brown (10YR 7/4) sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft when dry, very friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; many micro irregular pores; strongly effervescent; disseminated lime; moderately alkaline (pH 8.2); clear, smooth boundary; horizon 2 to 8 inches thick.

A12--8 to 19 inches, light yellowish-brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; soft when dry, friable when moist, slightly sticky and nonplastic when wet; common micro roots and a few very fine roots; a few to common micro irregular interstitial pores; violently effervescent; disseminated lime; moderately alkaline (pH 8.4); clear, smooth boundary; horizon 4 to 12 inches thick.

C1--19 to 31 inches, pale-yellow (2.5Y 7/4) heavy loam, light yellowish brown (2.5Y 6/4) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro and very fine roots; a few micro irregular pores and very fine tubular pores; a few thin clay films as bridges; violently effervescent; disseminated lime; strongly alkaline (pH 9.0); gradual, smooth boundary; horizon 12 to 20 inches thick.

C2ca--31 to 39 inches, white (2.5Y 8/2) loam, light brownish gray (2.5Y 6/2) moist; massive; weakly cemented; a few micro and very fine roots; a few micro irregular pores and very fine tubular pores; about 5 to 10 percent is rounded concretions 1/4 inch in diameter; fine irregularly shaped lime occurs as soft masses; violently effervescent; disseminated lime; strongly alkaline (pH 8.8); gradual, smooth boundary; horizon 8 to 11 inches thick.

C3ca--39 to 48 inches, white (2.5Y 8/2) loamy soil material (texture obscured by lime and cementation), light brownish gray (2.5Y 6/2) moist; massive; indistinct lenses that are strongly cemented with lime; the hardest lenses are discontinuous and slake in water; a few micro roots; a few very fine tubular pores; violently effervescent; disseminated lime; moderately alkaline (pH 8.4); gradual, smooth boundary; horizon 9 to 14 inches thick.

C4--48 to 57 inches, light olive-brown (2.5Y 5/4) light loam, olive brown (2.5Y 4/4) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro roots; common micro irregular pores; slightly effervescent; disseminated lime; moderately alkaline (pH 8.2); gradual, smooth boundary; horizon 8 to 12 inches thick.

C5--57 to 65 inches, grayish-brown (2.5Y 5/2) gravelly coarse sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; no roots; 20 to 25 percent is gravel, by volume; many micro irregular pores; mildly alkaline (pH 7.8).

The A horizon ranges from light yellowish brown or pale brown to very pale brown or light brownish gray in color. Texture is sandy loam, loam, or loamy fine sand. Reaction ranges from mildly alkaline to moderately alkaline, and effervescence is strong to violent.

The C1 horizon has granular or blocky structure, or it is massive. The C2ca and C3ca horizons are white, light gray, or pale yellow in color. They range from loam to light silty clay loam in texture, are platy in structure, or are massive. In most places the material can be penetrated by an auger, but in a few places the horizons are cemented or indurated.

Color of the C4 and C5 horizons ranges from light olive brown to yellowish brown or grayish brown. In a few places faint mottles are few to common. Texture ranges from gravelly coarse sandy loam or coarse sandy loam to sandy loam or loam. Reaction ranges from mildly alkaline to moderately alkaline, and effervescence is slight to none.

Permeability of this soil is moderately slow. Available water holding capacity is 4.0 to 5.5 inches. Fertility is low. Runoff is very slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate. In most places roots can penetrate to a depth between 24 and 39 inches.

Included with this soil in mapping are areas of Sunrise loam and loamy fine sand that generally are less than 10 or 15 acres in size. Also included, and making up about 20 percent of the mapped area, is an unnamed soil that is similar to this Sunrise sandy loam but that contains indurated, very hard and massive, cemented horizons.

Sunrise sandy loam is used for such irrigated crops as alfalfa, pasture, small grains, sugar beets, and row crops that are shallow rooted. It is also used for range and for wildlife habitat. Capability unit IIIe-8 (30) irrigated, VIIe-1 (30) dryland; range site 6.

Sunrise sandy loam, shallow (Sw).--This soil occupies fairly small, scattered areas on the basin rim near the Mira Loma Facility and Antelope Valley College. Depth to the horizon that is cemented with lime ranges from 10 to 15 inches. This horizon generally is quite dense and can be augered only with difficulty. Available water holding capacity is 2.0 to 3.0 inches. The hazard of soil blowing is moderate.

Included with this soil in mapping is an unnamed soil, which has an indurated layer that can be broken by a hammer but cannot be cut by an auger or a shovel. Also included are small areas of Sunrise

loam. Other included small areas, in nonirrigated places under saltbushes, have slight to moderate accumulations of salts and alkali.

This Sunrise soil is used for irrigated pasture, for poultry ranches, and as range in spring. Capability unit IVe-8 (30) irrigated, VIIe-1 (30) dryland; range site 6.

Sunrise loamy fine sand (Su).--Except that the surface layer is loamy fine sand, the profile of this soil is similar to that described for Sunrise sandy loam. Also similar is the unnamed soil included in mapping. Available water holding capacity is 3.5 to 5.0 inches. The hazard of soil blowing is moderate.

Included with this soil in mapping are some nonirrigated areas where wind has blown the surface soil into hummocks that range from 18 to 36 inches in height.

Sunrise loamy fine sand is used about the same as Sunrise sandy loam. Capability unit IIIe-8 (30) irrigated, VIIe-4 (30) dryland; range site 6.

Sunrise loam (Sx).--Except that the surface layer is loam, the profile of this soil is similar to that described for Sunrise sandy loam. Available water holding capacity is 4.5 to 6.0 inches.

Sunrise loam is used about the same as Sunrise sandy loam. Capability unit IIIe-8 (30) irrigated, VIIe-1 (30) dryland; range site 6.

Sunrise loam, saline-alkali (Sy).--This soil has a loam surface layer, but its profile otherwise is similar to that described for Sunrise sandy loam. Also, enough saline-alkali has accumulated in this soil to affect the growth of cultivated crops. Available water holding capacity is 4.0 to 6.0 inches. The hazard of water erosion is slight.

Included with this soil in mapping are small areas in which the accumulation of saline-alkali is moderate to severe. Also included are some small areas that have no accumulations of salts or exchangeable sodium. Other included small areas have a surface layer of light clay loam to clay loam. Still other included areas, 5 to 10 acres in size, consist of small hummocks of sandy loam at the base of desert shrubs.

This Sunrise soil is used only as range in spring. Capability unit IIIe-8 (30) irrigated, VIIs-6 (30) dryland; range site 6.

Temescal Series

The Temescal series consists of well-drained soils formed in material weathered from andesite that included lenses of tuff. These soils are on hilly uplands. Slopes range from 30 to 50 percent. Annual grasses and forbs and a few scattered bushes of California juniper make up the vegetation. Elevations range from 2,900 to 3,400 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is 61° F., and the frost-free season ranges from 210 to 240 days. Temescal soils are associated with Anaverde and Millsholm soils.

In a typical profile the surface layer is light brownish-gray sandy loam about 5 inches thick. Below is light brownish-gray heavy sandy loam about 15 inches thick. Slightly weathered, light-gray andesite is at a depth of about 20 inches.

These soils are used for range and for wildlife habitat.

Temescal-Rock land complex, 30 to 50 percent slopes (TrF).--This is the only unit mapped in the Temescal series in this Area. It is in the northwestern part of the survey area. About 50 percent is Temescal sandy loam, 30 to 50 percent slopes, and 45 percent is Rock land. Rock land is described in this survey in alphabetical order. Following is a typical profile of Temescal sandy loam, 30 to 50 percent slopes (SE1/4SW1/4 sec. 14, T. 8 N., R. 17 W.):

A1--0 to 5 inches, light brownish-gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; moderate, fine, subangular blocky structure; slightly hard when dry, friable when moist, nonsticky and slightly plastic when wet; many micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; about 5 percent, by volume, is andesite gravel; slightly acid (pH 6.5); clear, wavy boundary; horizon 4 to 5 inches thick.

B2--5 to 20 inches, light brownish-gray (10YR 6/2) heavy sandy loam near loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard and hard when dry, firm when moist, nonsticky and slightly plastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.5); gradual, wavy boundary; horizon 10 to 15 inches thick.

R1--20 to 26 inches, slightly weathered light-gray andesite.

R2--26 to 30 inches, slightly weathered, light-gray andesite that includes a few lenses of interbedded soft tuff.

The A horizon ranges from light grayish brown or grayish brown to dark yellowish brown or yellowish brown in color. Texture is sandy loam or heavy sandy loam. The content of organic matter is low. The B2 horizon is light brownish-gray or grayish-brown heavy sandy loam or loam. Throughout the profile reaction ranges from slightly acid to neutral.

Permeability is moderate. Available water holding capacity is 2.0 to 3.0 inches. Fertility is low, runoff is rapid, and the hazard of erosion is high. In most places roots can penetrate to a depth of 14 to 20 inches.

Included with this complex in mapping, and making up about 5 percent of each area, is an unnamed strongly sloping soil on toe slopes. This unnamed soil has a surface layer of dark-gray or dark grayish-brown, massive and hard loam. The subsoil is

reddish-brown heavy clay loam that has angular blocky or weak prismatic structure. Also included are about 150 acres of soils along Davenport Road, about three-fourths of a mile west of Agua Dulce, that formed in material from calcareous tuff. These soils are loamy throughout and are moderately alkaline. Other included small areas consist of Gaviota rocky sandy loam and of Millsholm rocky loam.

This complex is used for range, wildlife, and watershed. Capability unit for Temescal part VIIe-1 (19) dryland, and for Rock land, VIIIs-1 (19, 20, 30) dryland; range site 4 for Temescal part, but not assigned for Rock land part.

Terrace Escarpments

Terrace escarpments (TsF) occurs throughout the middle and western parts of the survey area. This land type consists of short, moderately steep to steep faces or breaks that separate the terraces from the lower lying alluvial fans. The surface layer generally is coarse sandy loam. Slopes generally are about 35 percent, but they range from 15 to 45 percent. Annual grasses and forbs make up the vegetation. Runoff is medium to rapid, and the hazard of erosion is moderate to high.

Included with this land type in mapping are small areas where rill and gully erosion are severe. Also included are a few large, deep gullies that are actively eroding.

Terrace escarpments are used only incidentally for grazing. The areas are used mainly to provide cover for wildlife. Capability unit VIIe-1 (19) dryland, VIIe-1 (20) dryland; range site 2.

Toomes Series

In the Toomes series are somewhat excessively drained soils that formed on uplands in material weathered from basalt. Slopes range from 30 to 50 percent. The vegetation is mainly annual grasses and forbs, but California juniper and candlestick yucca grow in some places. Elevations range from 2,600 to 3,500 feet. Average annual precipitation is about 9 to 12 inches, average annual temperature is 62° F., and the frost-free season is about 210 to 240 days. Toomes soils are associated with Las Posas soils.

Typically the surface layer is dark grayish-brown loam about 3 inches thick. Below is yellowish-brown loam about 14 inches thick. Hard basalt is at a depth of about 17 inches.

These soils have moderate permeability. Available water holding capacity is 2.0 to 3.0 inches. Fertility is low. Runoff is rapid, and the hazard of erosion is high. In most places roots can penetrate to a depth of 12 to 18 inches, which is the depth to parent rock.

Toomes soils are used for range. They also provide cover for wildlife. In this survey area Toomes soils are closely intermingled with areas of Las Posas soils and are mapped in a complex with those soils. The complex is described under the Las Posas series.

Typical profile of a Toomes loam (in Los Angeles County; 130 feet south of yellow county marker on dirt road that is 1.7 miles from intersection of old Sierra Highway and Mountain Springs Road; near Vincent; NW1/4SE1/4NE1/4 sec. 21, T. 5 N., R. 12 W.):

A1--0 to 3 inches, dark grayish-brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate, fine, granular structure; soft when dry, very friable when moist, slightly sticky and slightly plastic when wet; many micro roots and common very fine roots; many micro irregular pores; neutral (pH 6.6); clear, smooth boundary; horizon 2 to 4 inches thick.

B2--3 to 17 inches, yellowish-brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; massive; hard when dry, friable when moist, slightly sticky and plastic when wet; common micro and very fine roots and a few fine roots; many micro irregular pores and common micro tubular pores; many thin clay films occur as bridges between mineral grains and a few thin clay films occur in pores; in lower 4 or 5 inches, about 10 to 20 percent is weathered basalt fragments; neutral (pH 7.0); gradual, wavy boundary; horizon 10 to 14 inches thick.

R--17 inches, hard basalt.

The A horizon ranges from dark grayish brown to dark brown or dark yellowish brown, and the color is one value lower when moist. Texture ranges from loam to light clay loam. Structure generally is weak to moderate granular, or the soil is massive. Bedrock crops out on 5 to 10 percent of the surface area, and pebbles and cobblestones cover 5 to 15 percent of the surface. The B horizon is yellowish brown or dark yellowish brown. Texture ranges from loam to heavy loam, and the increase in clay is only 2 or 3 percent. Clay films range from few to many. They generally are thin and occur as bridges or are inside pores. Depth to parent rock ranges from 12 to 18 inches.

Tray Series

Soils of the Tray series are moderately well drained. They are forming in granitic alluvium on the basin rim. Slopes are 0 to 2 percent. The vegetation is mainly fourwing saltbush and other kinds of saltbushes, but rabbitbrush grows in some areas. The understory is thin and consists of saltgrass, annual grasses, and forbs. Elevations range from 2,320 to 2,400 feet. Average annual precipitation ranges from 4 to 9 inches, average annual temperature is about 62° F., and the frost-free season ranges from 240 to 260 days. Tray soils are associated with Oban, Pond, and Sunrise soils.

In a typical profile the surface layer is light yellowish-brown sandy loam about 8 inches thick. The subsoil is yellowish-brown and light yellowish-brown heavy sandy loam and sandy loam about 24 inches thick. It is underlain by light yellowish-brown, coarse sandy loam that is

stratified and is about 38 inches thick. In some places the surface layer is fine sand or is loam. Some areas are hummocky, and some are not affected by salts or alkali.

These soils are used for irrigated crops and for range in spring. They also provide habitat for wildlife.

Tray sandy loam, saline-alkali (Tv).--Areas of this soil are on the basin rim north of the Mira Loma Facility.

Typical profile (90 feet north of Avenue H and 225 feet east of 50th Street West; SW1/4SW1/4 sec. 1, T. 7 N., R. 12 W.):

A1--0 to 8 inches, light yellowish-brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro and very fine roots and a few fine roots; common micro irregular pores and a few very fine tubular pores; slightly effervescent; disseminated lime; very strongly alkaline (pH 9.2); clear, smooth boundary; horizon 6 to 16 inches thick.

B2t--8 to 20 inches, yellowish-brown (10YR 5/4) heavy sandy loam near loam, dark yellowish brown (10YR 4/4) moist; massive; hard when dry, firm when moist, slightly sticky and nonplastic when wet; common micro roots and a few very fine roots; many micro irregular pores and very fine tubular pores and common fine tubular pores; common moderately thick clay films and many thin clay films occur in pores and as bridges; strongly effervescent; disseminated lime; very strongly alkaline (pH 9.5); gradual, smooth boundary; horizon 12 to 16 inches thick.

B3--20 to 32 inches, light yellowish-brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; many micro irregular pores and common very fine and fine tubular pores; a few thin clay films occur in pores and as bridges; strongly effervescent; disseminated lime; very strongly alkaline (pH 9.5); diffuse, smooth boundary; horizon 10 to 14 inches thick.

C1--32 to 55 inches, light yellowish-brown (10YR 6/4) coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; many micro irregular pores, common very fine irregular pores, and a few very fine and fine tubular pores; strongly effervescent; disseminated lime; very strongly alkaline (pH 9.5); diffuse, smooth boundary; horizon 20 to 24 inches thick.

C2--55 to 70 inches, light yellowish-brown (10YR 6/4) coarse sandy loam, yellowish brown (10YR 5/4 moist; massive; hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro and very fine roots; many and common micro irregular pores, many very fine tubular pores, and common fine tubular pores; about 2 or 3 very thin plates that are cemented with lime; violently effervescent; disseminated lime and some lime as filaments or threads; strongly alkaline (pH 8.6).

The A horizon generally is light yellowish brown, pale brown, or brown, but in a few places it is light brownish gray or light yellowish brown. Texture is sandy loam or fine sandy loam. The B2t horizon is yellowish brown, light gray, light brownish gray, grayish brown, or brown. Texture typically is sandy loam or loam, and the clay content is less than 18 percent. The content of exchangeable sodium is moderate. The B3 horizon is light yellowish-brown, pale-brown, very pale brown, light-gray, or light brownish-gray sandy loam to coarse sandy loam. Color of the C horizon is very pale brown, grayish brown, brown, light olive brown, or light yellowish brown. Texture is coarse sandy loam, loamy sand, or loamy coarse sand. The saline-alkali content varies from place to place, but it is never high enough to prevent reclaiming the areas.

Permeability of this soil is moderate. Available water holding capacity is 5.5 to 6.5 inches. Fertility is low. Runoff is very slow, and the hazard of water erosion is none to slight. The hazard of soil blowing is slight to moderate. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hesperia fine sandy loam and of Pond loam. Also included are small areas of soils that have a surface layer of loam and loamy fine sand.

Tray sandy loam, saline-alkali, is used for range and for wildlife habitat. Capability unit IIIs-6 (30) irrigated, VIIs-6 (30) dryland; range site 6.

Tray sandy loam (Tu).--This soil has been reclaimed, but its profile is otherwise like that described for Tray sandy loam, saline-alkali. The surface layer is light yellowish brown and is about 7 inches thick. The hazard of soil blowing is moderate. Available water holding capacity is 5.5 to 6.5 inches.

Included with this soil in mapping are small areas that have a surface layer of loam. Also included are small areas of Cajon loamy sand and of Hesperia fine sandy loam.

Tray sandy loam is used mainly for alfalfa, but it is suited to many other crops that are adapted to the climate. Capability unit IIe-1 (30) irrigated, VIIe-1 (30) dryland; range site 6.

Tray fine sand, hummocky (Tt2).--This soil is on higher better drained parts of the basin rim, northeast of Lancaster. It consists of light brownish-gray fine sand that has been piled by the wind into hummocks. The hummocks are 18 to 36 inches high. In a few places low sand dunes occur. The vegetation is mainly fourwing saltbush, though Joshua-trees, alkali sacaton, Mormon tea, sagebrush, and sparse stands of annual grasses grow in some areas. Available water holding capacity is 4.5 to 5.5

inches. The hazard of soil blowing is high. Fertility is low.

Included with this soil in mapping, and making up about 20 percent of the total acreage, are areas of Pond silty clay loam. This included soil occupies playas in the lower parts of the basin. The areas are within a short distance of areas of this Tray soil, and the two soils occur together in a complex microrelief pattern.

Tray fine sand, hummocky, is used only for range in spring. Capability unit IIIe-4 (30) irrigated, VIIe-4 (30) dryland; range site 6.

Tray loam, saline-alkali (Tw).--The surface layer of this soil is pale-brown loam about 6 to 12 inches thick. Structure is platy, or the soil is massive. The hazard of erosion is slight. Available water holding capacity is about 6.0 to 7.0 inches.

Included with this soil in mapping are some areas, 5 to 10 acres in size, that have a surface layer of silty clay loam and clay loam. Also included are small areas of Pond loam, of Pond-Oban complex, and of Rosamond loam, saline-alkali.

Tray loam, saline-alkali, is used only for range in spring. Capability unit IIIs-6 (30) irrigated, VIIs-6 (30) dryland; range site 6.

Vernalis Series

The Vernalis series consists of well-drained soils that have formed in alluvium on fans. The alluvium is dominantly granitic, but it also includes material from andesite, tuff, and such sedimentary rocks as shale, sandstone, and limestone. Slopes are 0 to 5 percent. The vegetation is chiefly annual grasses and forbs, though sagebrush and rabbitbrush grow in some areas. Elevations range from 2,900 to 3,000 feet. Average precipitation is 9 to 12 inches, average annual temperature is 62° F., and the frost-free season is about 220 to 260 days. Vernalis soils are associated with Hanford and Oakdale soils.

In a typical profile the surface layer is light brownish-gray and brown loam about 14 inches thick. The subsoil is pale-brown loam about 21 inches thick. It is underlain by pale-brown loam and sandy loam about 25 inches thick. Thin strata of coarse-textured material generally occur at a depth below 40 inches. In some places the surface layer is sandy loam, and in others it is clay loam.

These soils are used for irrigated crops and dryland crops. They also are used for range.

Vernalis loam, 0 to 2 percent slopes (VbA).--This soil is on alluvial fans along the lower part of Oso Canyon Creek.

Typical profile (120 feet south of the farm road and 560 feet west of the northeast corner of the section; NE1/4NE1/4 sec. 11, T. 8 N., R. 17 W.):

Ap--0 to 5 inches, light brownish-gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; moderate, fine and medium, subangular blocky structure; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; common micro roots and a few very fine roots; common micro and very fine irregular pores and a few very fine tubular pores; mildly alkaline (pH 7.8); clear, smooth boundary; horizon 4 to 6 inches thick.

A1--5 to 14 inches, brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; massive; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; common micro roots; common micro and very fine irregular pores and a few very fine tubular pores; a few colloid stains on mineral grains; mildly alkaline (pH 7.8); gradual, smooth boundary; horizon 4 to 10 inches thick.

B2--14 to 35 inches, pale-brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; hard when dry, firm when moist, slightly sticky and nonplastic when wet; a few micro roots; common micro irregular pores and common micro and very fine tubular pores; moderately alkaline (pH 8.0); gradual, smooth boundary; horizon 20 to 24 inches thick.

C1--35 to 55 inches, pale-brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; slightly hard when dry, firm when moist, slightly sticky and nonplastic when wet; a few micro roots; common micro irregular and tubular pores and a few very fine tubular pores; very slightly effervescent; disseminated lime; moderately alkaline (pH 8.0); gradual, smooth boundary; horizon 18 to 22 inches thick.

C2--55 to 60 inches, pale-brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; a few micro roots; common micro irregular pores; slightly effervescent; disseminated lime; moderately alkaline (pH 8.2).

The A horizon generally is light brownish gray, but it ranges from pale brown to brown. Structure is subangular blocky, or the soil is massive. Reaction is neutral to mildly alkaline. The B2 horizon is pale brown or brown. The C horizon generally is loam, light clay loam, or sandy loam to a depth below 40 inches, but it may be stratified with thin lenses of loamy sand or fine gravelly loamy sand. It is mildly alkaline to moderately alkaline. The content of lime varies. At a depth below 30 inches, however, the solum typically is very slightly effervescent to strongly effervescent and contains disseminated lime.

Permeability of this soil is moderate. Available water holding capacity is 9.0 to 10.0 inches. Fertility is moderate, runoff is very slow, and the hazard of erosion is none to slight. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Oak Glen sandy loam and of Rosamond loam. Also included are areas of gravelly depositional material that are 2 to 4 acres in size. These included areas occur where intermittent streams from adjacent uplands fan out over this soil.

This Vernalis soil is used for irrigated crops

and dryland crops. It also is used for range. Capability unit I-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Vernalis loam, 2 to 5 percent slopes (VbB).--This soil is more sloping, but it otherwise is similar to Vernalis loam, 0 to 2 percent slopes. The dominant slope ranges from 2 to about 4 percent.

Runoff is slow on this soil, and the hazard of erosion is slight. Available water holding capacity is 9.0 to 10.0 inches.

Included with this soil in mapping are a few areas that have slopes of 6 or 8 percent. Also included are small areas of Hanford sandy loam and of Vernalis sandy loam. In other included areas, 5 to 10 acres in size, sheet and rill erosion are moderate.

This Vernalis soil is used about the same as Vernalis loam, 0 to 2 percent slopes. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Vernalis sandy loam, 0 to 2 percent slopes (VaA).--The surface layer of this soil is pale-brown or light brownish-gray sandy loam about 8 to 12 inches thick. It has moderate subangular blocky structure.

The hazard of soil blowing is slight on this soil. Available water holding capacity is 8.5 to 9.5 inches.

Included with this soil in mapping are small areas of Hanford sandy loam and of Oak Glen sandy loam.

This Vernalis soil is used about the same as Vernalis loam, 0 to 2 percent slopes. Capability unit I-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

Vernalis clay loam, 0 to 2 percent slopes (VcA).--The surface layer of this soil is massive clay loam about 8 to 12 inches thick. Runoff is very slow, and the hazard of erosion is none to slight. Available water holding capacity is 9.5 to 10.5 inches. Included in mapping are small areas of Vernalis loam.

This Vernalis soil is used for sugar beets, irrigated small grains, dryland small grains, and range. Capability unit I-1 (19) irrigated, IVec-1 (19) dryland; range site 1.

Vista Series

In the Vista series are well-drained soils that formed in material weathered from granitic rock. These soils are on foothills in the uplands. Slopes range from 9 to 50 percent. The vegetation is chiefly annual grasses and forbs, though clumps of chamise and California juniper are scattered over the areas and manzanita grows in some places. Elevations range from 2,200 to 3,900 feet. Average annual precipitation ranges from 14 to 16 inches, average annual temperature is about 62¼ F., and the frost-free season ranges from 210 to 240 days. Vista soils are associated with Amargosa and Anaverde soils.

Typically the surface layer is brown coarse sandy loam about 16 inches thick. The subsoil is brown sandy loam about 12 inches thick and contains 2 or 3 percent more clay than the surface layer. Below is yellowish-brown coarse sandy loam about 4 inches thick. Hard granitic rock is at a depth of about 32 inches.

These soils are used for dryland small grains and range. They also are used for wildlife habitat and for watershed purposes.

Vista coarse sandy loam, 30 to 50 percent slopes (VsF).--This soil is in the uplands on Pelona Ridge.

Typical profile (180 feet west of the farm road and 600 feet south of the north section line; NE1/4NE1/4 sec. 35, T. 7 N., R. 14 W.):

A1--0 to 16 inches, brown (10YR 5/3) coarse sandy loam, dark brown (10YR 3/3) moist; massive; hard when dry, friable when moist; nonsticky and nonplastic when wet; many micro and common very fine and a few fine roots; many micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.4); clear, smooth boundary; horizon 12 to 18 inches thick.

B2--16 to 28 inches, brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; massive; hard when dry, friable when moist, slightly sticky and nonplastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; two krotovinas 2 inches in diameter filled with soil material from the A1 horizon; a few thin clay films occur in pores and as bridges; neutral (pH 6.8); clear, wavy boundary; horizon 12 to 14 inches thick.

C--28 to 32 inches, yellowish-brown (10YR 5/4) coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; hard when dry, friable when moist, slightly sticky and nonplastic when wet; common micro and a few very fine tubular pores; one krotovina 2 inches in diameter filled with material from the A1 horizon; neutral (pH 7.0); clear, wavy boundary; horizon 4 to 6 inches thick.

R--32 inches, hard granitic rock.

The A horizon ranges from dark grayish brown or grayish brown to brown in color. Texture is coarse sandy loam or sandy loam near loam. This horizon generally is hard and massive when dry, but the structure may be weak when moist. The B2 horizon ranges from dark grayish brown to brown in color. Texture ranges from coarse sandy loam to sandy loam and heavy sandy loam, and the content of clay is less than 18 percent. The C horizon ranges from yellowish brown to brown in color and from coarse sandy loam to loam in texture. Reaction ranges from slightly acid in the surface layer to neutral below. Depth to parent rock ranges from about 28 to 38 inches, but it generally is about 32 inches.

Permeability of this soil is moderately rapid. Available water holding capacity is 2.5 to 3.5

inches. Fertility is low. Runoff is rapid, and the hazard of erosion is high. In most places roots can penetrate to a depth of about 28 to 38 inches.

Included with this soil in mapping are small areas of Amargosa rocky coarse sandy loam and of Sheridan sandy loam.

This Vista soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (19) dryland; range site 2.

Vista coarse sandy loam, 9 to 15 percent slopes, eroded (VsD2).--This soil is on rolling uplands. In most areas moderate sheet and rill erosion has taken place, and a few areas are cut by shallow gullies. The surface layer is about 14 inches thick. Runoff is medium, and the hazard of further erosion is moderate.

Included with this soil in mapping are a few small areas that have pebbles and cobblestones on the surface. Also included are small areas of Amargosa rocky coarse sandy loam and small areas that have slopes of 15 to 30 percent. About 800 acres of Vista soil that are not eroded also are included.

This Vista soil is used for dryland small grains and range and for wildlife habitat. Capability unit IVe-1 (19) irrigated; range site 2.

Vista coarse sandy loam, 15 to 30 percent slopes (VsE).--Many areas of this soil are hilly. Slopes commonly range from 18 to 26 percent. Runoff is medium to rapid, and the hazard of erosion is moderate to high.

Included with this soil in mapping are small areas that have a surface layer of sandy loam. Also included are small areas that are moderately eroded. Still other included small areas consist of Amargosa rocky coarse sandy loam.

This Vista soil is used for range, wildlife habitat, and watershed. Capability unit VIe-1 (19) dryland; range site 2.

Vista coarse sandy loam, 15 to 30 percent slopes, eroded (VsE2).--This soil is on hilly uplands. In most places slopes range from 20 to 30 percent. Much of the original surface layer has been removed through sheet and rill erosion, and many shallow gullies cut the areas. In most places the present surface layer is about 12 to 14 inches thick. A few areas are cut by deep gullies. Runoff is medium to rapid, and the hazard of further erosion is moderate to high.

Included with this soil in mapping are small areas that have a surface layer of sandy loam. Also included are small areas of Amargosa rocky coarse sandy loam and of Vista coarse sandy loam, 30 to 50 percent slopes.

This Vista soil is used for range, wildlife habitat, and watershed purposes. Capability unit VIe-1 (19); range site 2.

Vista coarse sandy loam, 30 to 50 percent slopes, eroded (VsF2).--Much of the original surface layer of this soil has been removed through sheet and rill erosion. Many areas are cut by shallow gullies, and a few areas are cut by deep gullies. The present surface layer is 8 to 12 inches thick. Slopes range from 35 to 45 percent in most places, but they are as steep as 55 percent in a few places. Runoff is rapid, and the hazard of further erosion is high.

Included with this soil in mapping are small areas that have a surface layer of sandy loam. Also included are small, slightly eroded areas. Other included small areas consist of Amargosa rocky coarse sandy loam.

This Vista soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1 (19) dryland; range site 2.

Wyman Series

Wyman soils are well drained and have formed in basic igneous alluvium on alluvial fans and terraces. Slopes range from 2 to 15 percent. The vegetation is chiefly annual grasses and forbs, but California juniper and candlestick yucca grow in some areas. Elevations range from 2,800 to 3,400 feet. Average annual precipitation ranges from 9 to 12 inches, average annual temperature is about 61° F., and the frost-free season ranges from 240 to 275 days. Wyman soils are associated with Las Posas and Toomes soils.

In a typical profile the surface layer is yellowish-brown and brown gravelly loam about 10 inches thick. Below is brown and reddish-brown gravelly light clay loam and gravelly clay loam about 45 inches thick. At a depth of about 55 inches is brown gravelly sandy loam that generally is stratified. The surface layer is cobbly in some places.

These soils are used for dryland small grains and for range in spring. They also are used for wildlife habitat.

Wyman gravelly loam, 2 to 9 percent slopes (WgC).--This soil is on terraces near Acton and Vincent.

Typical profile (along Sierra Highway, 0.2 mile west of the intersection of Santiago Road and Sierra Highway, and 35 feet north; SW1/4SW1/4 sec. 29, T. 5 N., R. 12 W.):

A11--0 to 3 inches, yellowish-brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 3/4) moist; weak, very fine and fine, subangular blocky structure; slightly hard when dry, very friable when moist, nonsticky and nonplastic when wet; common micro tubular pores and a few very fine tubular pores; about 15 to 20 percent is fine gravel, by volume; slightly acid (pH 6.5); abrupt, smooth boundary; horizon 2 to 3 inches thick.

A12--3 to 10 inches, brown (10YR 5/3) gravelly loam, dark brown (10YR 4/3) moist; massive; hard when dry, very friable when moist, slightly sticky and nonplastic when wet; common micro roots and a few very fine and fine roots; common micro and very fine irregular pores, common micro and very fine tubular pores,

and a few fine tubular pores; about 15 to 20 percent is fine gravel, by volume; neutral (pH 7.0); gradual, smooth boundary; horizon 6 to 11 inches thick.

B1t--10 to 24 inches, brown (7.5YR 6/4) gravelly light clay loam, dark brown (7.5YR 4/4) moist; weak, fine and medium, angular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro roots and a few very fine and fine roots; common micro irregular pores, common micro and very fine tubular pores, and a few fine tubular pores; about 15 to 20 percent is gravel, by volume; common thin clay films occur in pores and as bridges; neutral (pH 7.0); gradual, wavy boundary; horizon 10 to 14 inches thick.

B2t--24 to 41 inches, reddish-brown (5YR 4/4) gravelly clay loam, dark reddish brown (5YR 3/4) moist; weak, fine and medium, angular blocky structure; hard when dry, friable when moist, sticky and plastic when wet; a few micro and very fine roots; common very fine irregular pores, common very fine tubular pores, and a few fine tubular pores; about 15 to 30 percent is gravel, by volume; many moderately thick clay films occur in pores and as bridges and a few moderately thick clay films are on ped faces; neutral (pH 6.6); gradual, wavy boundary; horizon 16 to 20 inches thick.

B3t--41 to 55 inches, brown (7.5YR 5/4) gravelly light clay loam, dark brown (7.5YR 4/4) moist; weak, fine, subangular blocky structure; hard when dry, friable when moist, slightly sticky and plastic when wet; a few micro roots; common very fine irregular pores, common very fine tubular pores, and a few fine tubular pores; common thin clay films occur in pores and as bridges; about 15 to 30 percent is gravel, by volume; neutral (pH 6.6); gradual, wavy boundary; horizon 12 to 16 inches thick.

C--55 to 61 inches, brown (7.5YR 5/4) gravelly sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard when dry, friable when moist, nonsticky and nonplastic when wet; common micro irregular pores; about 15 to 20 percent is gravel, by volume; neutral (pH 6.6).

The A horizon generally is yellowish brown or brown, but it is strong brown in places. It is gravelly in most places, and the content of fine gravel ranges from 5 to 20 percent, by volume. Typically the A horizon is massive and hard when dry and weak subangular blocky when moist. The Bt horizon is brown, dark-brown, or reddish-brown gravelly light clay loam, gravelly clay loam, or gravelly heavy loam. Structure is angular or subangular blocky. The content of gravel is 15 to 30 percent, by volume. The C horizon generally is brown or dark-brown sandy loam, loam, or gravelly coarse sandy loam. It generally is stratified, and the upper part contains lime in places. Typically the content of fine gravel throughout the C horizon ranges from 15 to 20 percent, by volume. The profile is slightly acid to neutral.

Permeability of this soil is moderate. Available water holding capacity is 8.5 to 9.5 inches. Fertility is moderate. The gravel in the soil does not interfere much with tillage, but it reduces the available water holding capacity somewhat. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Greenfield sandy loam and of Wyman cobbly loam. Also included are small areas where sheet and rill erosion are moderate. Other included areas, less than 25 acres in size, are cut by many shallow gullies.

This Wyman soil is used for dryland small grains and range. It also is used for wildlife habitat. Capability unit IIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

<u>Wyman gravelly loam, 9 to 15 percent slopes</u> (WgD).--This soil is on alluvial fans and terraces. Slopes range from 10 to 14 percent in most places. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are small areas of Wyman cobbly loam. Also included are a few small areas where sheet and rill erosion are moderate and a few areas cut by shallow gullies.

This Wyman soil is used for dryland small grains and range. It also is used for wildlife habitat. Capability unit IIIe-1 (19) irrigated, IVec-1 (19) dryland; range site 2.

<u>Wyman cobbly loam, 5 to 9 percent slopes</u> (WoC).--This soil has a surface layer of brown, massive, slightly acid cobbly loam about 12 inches thick. Pebbles and cobblestones occupy from 5 to 15 percent of the surface area, and below they make up from 20 to 35 percent of the soil, by volume. A few larger stones and boulders are also on the surface of this soil. In most places slopes range from 6 to 9 percent. A few areas are cut by deep gullies.

Runoff is slow to medium on this soil, and the hazard of erosion is slight to moderate. Available water holding capacity is 5.5 to 7.0 inches. Fertility is low.

Included with this soil in mapping are small areas at the upper part of terraces that have slopes of 10 to 14 percent. Also included are small areas of Wyman gravelly loam, 2 to 9 percent slopes.

This Wyman soil is used for range in spring and for wildlife habitat. Capability unit VIe-7 (19) dryland; range site 2.

Yolo Series

In the Yolo series are well-drained soils that have formed in sedimentary alluvium. These soils are on alluvial fans. Slopes are 0 to 9 percent. Grasses and oaks make up the vegetation. Elevations range from 1,175 to 1,200 feet. Average annual

precipitation ranges from 14 to 16 inches, average annual temperature is 63° F., and the frost-free season ranges from 240 to 300 days. Yolo soils are associated with Metz, Mocho, and Sorrento soils.

Typically the surface layer is grayish-brown loam about 18 inches thick. Below is grayish-brown loam, also about 18 inches thick, underlain by light yellowish-brown loam near silt loam about 36 inches thick.

These soils are used mainly for irrigated crops, for range, and for homesites.

Yolo loam, 0 to 2 percent slopes (YoA).--This soil is on alluvial fans near Newhall and Saugus.

Typical profile (0.4 mile east of the intersection of U.S. Highway 99 and Lyons Canyon Road; 20 feet west of Wiley Canyon Road and 0.1 mile south of Lyons Canyon Road):

Ap--0 to 6 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak, fine, subangular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; medium acid (pH 6.0); clear, smooth boundary; horizon 4 to 6 inches thick.

A1--6 to 18 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common micro roots and a few very fine roots; common micro irregular pores and a few very fine tubular pores; slightly acid (pH 6.5); clear, smooth boundary; horizon 12 to 14 inches thick.

C1--18 to 36 inches, grayish-brown (10YR 5/2) loam, near silt loam, dark grayish brown (10YR 4/2) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; a few micro, very fine, and fine tubular pores; many worm casts, and one krotovina; a few colloid stains on mineral grains; neutral (pH 6.8); gradual, smooth boundary; horizon 12 to 18 inches thick.

C2--36 to 72 inches, light yellowish-brown (10YR 6/4) loam near silt loam, yellowish brown (10YR 5/4) moist; massive; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few micro roots; common micro tubular pores and a few micro irregular pores; neutral (pH 7.0); gradual, smooth boundary; horizon 24 to 36 inches thick.

The A horizon is grayish-brown to brown or dark grayish-brown loam or heavy loam. Structure is subangular blocky, or the soil is massive. The C1 horizon is light yellowish-brown to pale-brown, brown, or grayish-brown loam that is high in silt. A few colloidal stains and slight change in color are the only evidence of alteration. The C2 horizon is pale-brown or light yellowish-brown to yellowish-brown loam or very fine sandy loam. The profile generally is slightly acid in the upper part and neutral in the lower part. It typically is noncalcareous, but in places lime is present at a depth below 40 inches.

Permeability is moderate in this soil. Available water holding capacity is 8.5 to 10.5 inches. Fertility is high. Runoff is very slow, and the hazard of erosion is none to slight. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Metz loamy sand and of Sorrento loam. Also included are small areas that have a surface layer of sandy loam.

This Yolo soil is used for irrigated crops. Capability unit I-1 (19) irrigated; range site not assigned.

Yolo loam, 2 to 9 percent slopes (YoC).--This soil is on fairly narrow alluvial fans near Newhall and Saugus. Slopes range from 2 to 6 percent in most places. Runoff is slight to moderate, and the hazard of erosion is slow to medium.

Included with this soil in mapping are areas at the upper edge of alluvial fans that have slopes as steep as 10 to 12 percent. The soil in these areas is 5 to 10 percent, by volume, fine gravel throughout. Also included are small areas that have a surface layer of sandy loam or that have a few pebbles and stones on the surface. Other included small areas consist of Metz loamy sand and of Sorrento loam.

This Yolo soil is used mainly for irrigated crops and for range, but use for homesites is rapidly increasing. Capability unit IIe-1 (19) irrigated; range site 2.

Zamora Series

The Zamora series consists of well-drained soils that have formed in old alluvium derived from material that was dominantly sedimentary. These soils are on terraces. Slopes range from 2 to 15 percent. Grasses and oaks make up the vegetation. Elevations range from 1,220 to about 1,300 feet. Average annual precipitation ranges from about 14 to 16 inches, average annual temperature is 63° F., and the frost-free season ranges from 240 to 300 days. Zamora soils are associated with Mocho and Yolo soils.

In a typical profile the surface layer is grayish-brown loam about 11 inches thick. Below is brown and dark grayish-brown loam and clay loam underlain at a depth of about 58 inches by pale-brown loam. In some places the surface layer is clay loam.

These soils are used for dryland grains and for range. They also provide habitat for wildlife.

Zamora loam, 2 to 9 percent slopes (ZaC).--This soil is on long, smooth, convex terraces near Castaic Junction.

Typical profile (on the Humble Oil Company refinery road; 3.2 miles west of Castaic Junction,

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south from State Highway 126; 285 feet north and 40 feet east of unimproved road that leads into idle field):

Ap--0 to 3 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; hard when dry, firm when moist, nonsticky and slightly plastic when wet; common micro and very fine roots; common micro irregular pores; slightly acid (pH 6.3); abrupt, smooth boundary; horizon 2 to 4 inches thick.

A1--3 to 11 inches, grayish-brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; hard when dry, firm when moist, nonsticky and slightly plastic when wet; common micro and very fine roots; many micro irregular pores and a few very fine and fine tubular pores; slightly acid (pH 6.3); clear, smooth boundary; horizon 6 to 10 inches thick.

B1t--11 to 16 inches, brown (10YR 4/3) loam near silt loam, dark brown (10YR 3/3) moist; massive; hard when dry, firm when moist, slightly sticky and plastic when wet; a few micro roots; many micro irregular pores, common very fine tubular pores, and a few fine tubular pores; common thin clay films occur in pores and as bridges; slightly acid (pH 6.5); gradual, smooth boundary; horizon 4 to 6 inches thick.

B2t--16 to 35 inches, dark grayish-brown (10YR 4/2) clay loam near silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate, medium and coarse, subangular blocky structure; hard when dry, firm when moist, sticky and plastic when wet; a few micro and fine roots; many micro irregular pores, common very fine tubular pores, and a few fine and medium tubular pores; a few moderately thick clay films on ped faces, many thin clay films occur in pores and as bridges; neutral (pH 7.0); clear, smooth boundary; horizon 18 to 24 inches thick.

B3t--35 to 58 inches, brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak, medium and coarse, subangular blocky structure; hard when dry, firm when moist, slightly sticky and plastic when wet; a few micro roots; common micro irregular pores and a few very fine and fine tubular pores; common thin clay films occur in pores and as bridges; neutral (pH 7.3); clear, smooth boundary; horizon 23 to 26 inches thick.

C--58 to 84 inches, pale-brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive; hard when dry, firm when moist, slightly sticky and slightly plastic when wet; moderately alkaline (pH 8.0).

The A horizon is grayish-brown, brown, or dark grayish-brown loam to heavy loam. The Bt horizon is grayish brown, brown, or dark grayish brown. Texture is loam near silt loam to clay loam that is high in silt. Reaction is slightly acid to neutral. The C horizon is pale-brown or brown loam or sandy loam. Below a depth of 40 inches a small amount of lime may be present. The content of gravel in the soil profile ranges from 3 to 5 percent, by volume.

Permeability of this soil is moderately slow. Available water holding capacity is 10.0 to 11.0 inches. Fertility is moderate. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Roots can penetrate to a depth of 60 inches or more.

Included with this soil in mapping are small areas that have a surface layer of sandy loam or clay loam. Also included are about 75 acres where slopes are 0 to 2 percent.

This Zamora soil is used for dryland grains and range. It also is used for wildlife purposes. Capability unit IIe-1 (19) irrigated; range site 2.

Zamora loam, 9 to 15 percent slopes (ZaD).--This soil is on strongly sloping to nearly rolling terraces. In most places slopes range from 10 to 14 percent. Runoff is medium, and the hazard of erosion is moderate.

Included with this soil in mapping are small areas of Castaic silty clay loam and of Zamora clay loam. Also included are areas, less than 20 acres in size, where sheet and rill erosion are moderate.

This soil is used as range. It also is used as pump sites for oilfields, which occupy a large part of this unit. Capability unit IIIe-1 (19) irrigated; range site 2.

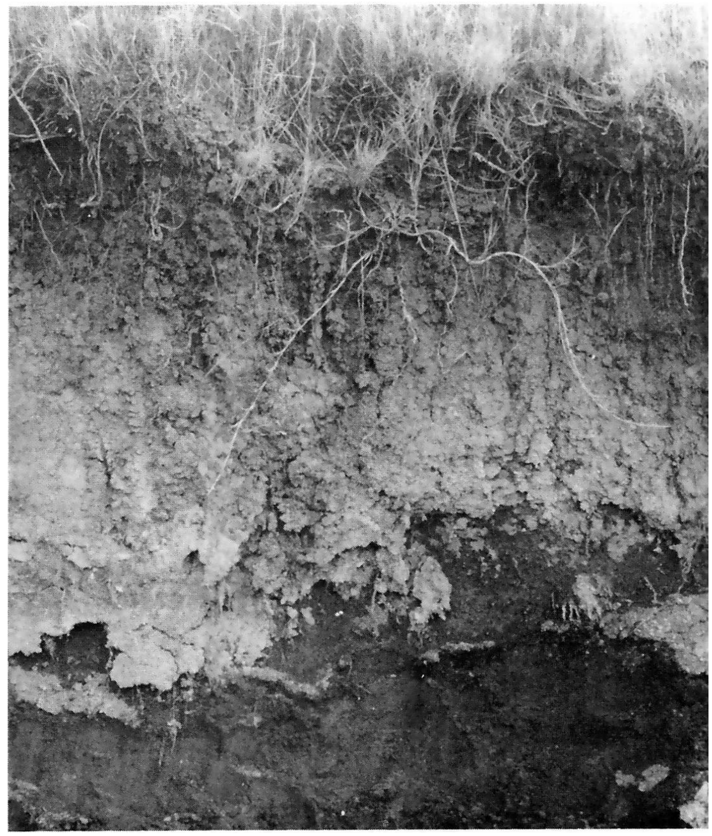
Zamora clay loam, 2 to 9 percent slopes (ZcC).--The surface layer of this soil is grayish-brown, slightly acid, massive clay loam about 8 to 10 inches thick. In most places slopes range from 5 to 7 percent.

Runoff is slow to medium on this soil, and the hazard of erosion is slight to moderate. Available water holding capacity is 10.5 to 11.5 inches. Fertility is moderate.

Included with this soil in mapping are small areas where sheet and gully erosion have occurred. Also included are small areas of gently rolling Castaic silty clay loam and Zamora loam on toe slopes.

This Zamora soil is used as range. It also is used as pump sites for oilfields, which occupy much of the acreage. Capability unit IIe-1 (19) irrigated; range site 1.

Area of Castaic and Balcom soils, which are underlain by soft shale and sandstone.

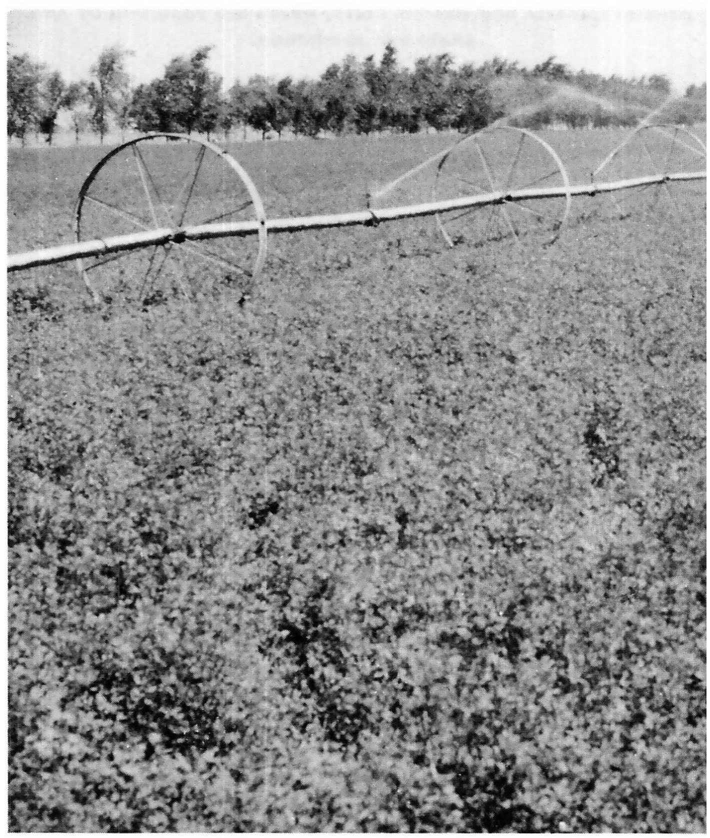


Typical Chino loam; the dark area at the bottom of the profile is caused by wetness.

Windbreak of bamboo along alfalfa field helps to reduce soil blowing on Hesperia loamy fine sand, 0 to 2 percent slopes.

Typical landscape of Las Posas-Toomes rocky loams, 30 to 50 percent slopes.

Profile of Las Posas rocky loam.



Sprinkler irrigation of alfalfa on Rosamond fine sandy loam.

In this section farm and nonfarm uses of the soils in the Antelope Valley Area are discussed. First use and management of the soils for cultivated crops and pasture is described and the vegetative soil groups are explained. Then use of the soils for range, for windbreaks, for wildlife, for recreation and related purposes, and for engineering are discussed.

The information in this section is useful to farmers and to planners. It also is useful to builders, to landscape architects, realtors, private and potential landowners, and to others interested in the use of the soils in the survey area for purposes other than farming. The survey area is near Los Angeles, and its population is increasing rapidly because the suburbs of that city are steadily expanding into areas formerly used for farming. Consequently, the demand for housing developments, shopping centers, schools, and for play areas, parks, golf courses, and other recreational areas also is increasing.

In selecting a site for a home, a highway, an industry, for recreational use, or for other nonfarm purposes, the limitations of the soils in each site for such use must be determined. Some of the more common properties affecting the use of the soils for nonfarm purposes are soil texture, reaction, and depth; steepness of slopes; depth to hard rock or the water table; presence of stones or rocks; drainage; and hazard of flooding. On basis of these and related characteristics, soil scientists and engineers have rated each soil in the survey for certain nonfarm purposes. These ratings are given in table 1, and the method of deriving them is explained in the subsection "Use of the Soils for Recreation and Related Purposes."

The ratings in table 1 are broad indicators of soil limitations for the purposes listed in the table. They are not a substitute for the detailed information that can be obtained by reading the descriptions of soil series and mapping units in this publication. Also, for most projects, an investigation should be made at all places seriously considered as a site for construction.

Use of the Soils for Cultivated Crops and Pasture

In this subsection the system of capability grouping used by the Soil Conservation Service is discussed, the soils in each capability unit are described, and management suited to the soils in each unit is suggested. Following this, estimated acre yields of the principal crops are given for those soils in the survey area that are widely used for crops, and the management required to obtain those yields is described. Then the Storie index rating of the soils is given.

Capability Groups of Soils

Capability grouping shows, in a general way, the suitability of soils for most common crops. The groups are made according to the limitations of the soils when used for common crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show limitations and hazards of groups of soils for range, for forest trees, or engineering.

In the capability system, the soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.
Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.
Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife. (None in the Antelope Valley Area.)
Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.
Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.
Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, _e_, _w_, _s_, or _c_, to the class numeral, for example, IIe. The letter _e_ shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; _w_ shows that water in or on the soil interferes with plant growth or cultivation (in some

TABLE 1.--SOIL INTERPRETATIONS FOR FARM AND NONFARM

Each mapping unit is described in the section "Descriptions of the Soils," beginning on p. 9. Dashes in the range various interpretative groups are described in the

Capability unit, p. 82.
Vegetative soil groups, p. 101.
Range sites, p. 106.

Map symbol	Soil name	Acres	Extent	Capability unit		Vegetative soil group	Range site	Windbreak group	Wildlife group
				Irrigated	Dryland				
			Percent						
AaB	Adelanto loamy sand, 2 to 5 percent slopes-----------	9,265	0.9	IIe-4 (30)	VIIe-4 (30)	B	8	2	2
AcA	Adelanto coarse sandy loam, 0 to 2 percent slopes----	13,045	1.2	IIe-4 (30)	VIIe-1 (30)	A	7	1	1
AdB	Adelanto gravelly sandy loam, 2 to 5 percent slopes-------------------	1,930	.2	IIe-4 (30)	VIIe-4 (30)	B	8	2	2
AgF	Agua Dulce stony loam, 30 to 50 percent slopes-----	6,960	.7	---------	VIIe-1 (19)	J	2	5	1
AmF2	Amargosa rocky coarse sandy loam, 9 to 55 percent slopes, eroded-----------	29,400	2.8	---------	VIIe-1 (19)	J	4	5	4
AnE	Anaverde loam, 15 to 30 percent slopes-----------	4,160	.4	---------	VIe-1 (20)	A	2	5	5
ApF	Anaverde rocky loam, 30 to 50 percent slopes--------	9,400	.9	---------	VIIe-1 (20)	J	2	5	5
AsB	Arizo gravelly loamy sand, 0 to 5 percent slopes----	13,390	1.3	---------	VIIe-4 (30)	J	8	5	2
AtA	Arizo loamy fine sand, 0 to 2 percent slopes---------	4,135	.4	IVe-4 (30)	VIIe-4 (30)	B	8	2	2
AyD	Ayar clay loam, 5 to 15 percent slopes-----------	1,005	(1/)	IVe-1 (19)	---------	A	1	5	1
CaA	Cajon loamy sand, 0 to 2 percent slopes-----------	31,000	3.0	IIIe-4 (30)	VIIe-4 (30)	B	8	2	2
CaC	Cajon loamy sand, 2 to 9 percent slopes-----------	32,900	3.1	IIIe-4 (30)	VIIe-4 (30)	B	8	2	2
CbA	Cajon loamy sand, loamy substratum, 0 to 2 percent slopes--------------	5,130	.5	IIe-4 (30)	VIIe-4 (30)	B	8	2	2
CcA2	Cajon loamy fine sand, 0 to 2 percent slopes, hummocky--------------------	14,545	1.4	IIIe-4 (30)	VIIe-4 (30)	B	8	2	2
CcD2	Cajon loamy fine sand, 9 to 15 percent slopes, hummocky--------------------	2,385	.2	IIIe-4 (30)	VIIe-4 (30)	B	8	2	2
ChC	Calvista-Hi Vista complex, 2 to 9 percent slopes----	39,975	3.8						
	Calvista part----------	-----	---	---------	VIIe-4 (30)	J	9	5	4
	Hi Vista part----------	-----	---	---------	VIIe-4 (30)	J	9	5	4
ChE	Calvista-Hi Vista rocky complex, 9 to 30 percent slopes-------------------	6,375	.6						
	Calvista part----------	-----	---	---------	VIIe-4 (30)	J	9	5	4
	Hi Vista part----------	-----	---	---------	VIIe-4 (30)	J	9	5	4

See footnote at end of table.

site column mean that the particular mapping unit is not used for range because of lack of sufficient forage. The section "Farm and Nonfarm Uses of the Soils," as follows:

Windbreak groups, p. 110.
Wildlife groups, p. 111.
Recreation and related purposes, p. 114.

Limitation rating for recreation and related purposes							
						Sewage lagoons	
Play areas	Picnic areas	Lawns and golf fairways	Campsites (intensive)	Paths and trails	Septic tank filter fields	Impound-ment area	Embank-ment
Moderate-----	Moderate----	Moderate------	Moderate----	Moderate--------	Slight--------	Moderate---	Moderate.
Slight-------	Slight------	Slight--------	Slight------	Slight----------	Slight--------	Moderate---	Moderate.
Severe-------	Moderate----	Moderate------	Moderate----	Moderate--------	Slight--------	Moderate---	Moderate.
Severe-------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Severe.
Severe-------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Severe.
Severe-------	Severe------	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Moderate.
Severe-------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Moderate.
Severe-------	Moderate----	Severe--------	Moderate----	Moderate--------	Slight--------	Severe-----	Severe.
Moderate-----	Moderate----	Severe--------	Moderate----	Moderate--------	Slight--------	Severe-----	Severe.
Severe-------	Moderate----	Moderate------	Severe------	Moderate--------	Severe--------	Severe-----	Moderate.
Moderate-----	Moderate----	Severe--------	Moderate----	Moderate--------	Slight--------	Severe-----	Severe.
Severe-------	Moderate----	Severe--------	Moderate----	Moderate--------	Moderate------	Severe-----	Severe.
Moderate-----	Moderate----	Severe--------	Moderate----	Moderate--------	Moderate------	Moderate---	Moderate.
Severe-------	Moderate----	Severe--------	Moderate----	Moderate--------	Slight--------	Severe-----	Severe.
Severe-------	Moderate----	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Severe.
Severe-------	Slight------	Moderate------	Slight------	Slight----------	Severe--------	Severe-----	Moderate.
Severe-------	Severe------	Moderate------	Severe------	Moderate--------	Severe--------	Severe-----	Slight.
Severe-------	Severe------	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Moderate.
Severe-------	Severe------	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Slight.

Map symbol	Soil name	Acres	Extent	Capability unit		Vegetative soil group	Range site	Windbreak group	Wildlife group
				Irrigated	Dryland				
			Percent						
CkC	Castaic silty clay loam, 2 to 9 percent slopes-----	170	(1/)	IIIe-1 (19)	---------	A	1	1	1
CkD	Castaic silty clay loam, 9 to 15 percent slopes----	425	(1/)	IIIe-1 (19)	---------	A	1	1	1
CmD	Castaic-Balcom silty clay loams, 9 to 15 percent slopes--------------------	260	(1/)	IIIe-1 (19)	---------	A	1	1	1
CmE	Castaic-Balcom silty clay loams, 15 to 30 percent slopes--------------------	3,115	.3	IVe-1 (19)	---------	A	1	1	1
CmF	Castaic-Balcom silty clay loams, 30 to 50 percent slopes--------------------	9,350	.9	---------	VIe-1 (19)	A	1	5	1
CmF2	Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded------------	12,425	1.2	---------	VIe-1 (19)	A	1	5	1
CmG2	Castaic-Balcom silty clay loams, 50 to 65 percent slopes, eroded------------	1,640	.2	---------	VIIe-1 (19)	J	1	5	6
CnG3	Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded-----------	9,235	.9	---------	VIIIe-1 (19,20,30)	J	---	5	6
Co	Chino loam------------------	2,140	.2	IIw-2 (19)	---------	E	5	3	3
CyA	Cortina sandy loam, 0 to 2 percent slopes------------	1,825	.2	IVs-0 (19)	---------	B	3	2	2
CyC	Cortina sandy loam, 2 to 9 percent slopes------------	920	(1/)	IVs-0 (19)	---------	B	3	2	2
CzC	Cortina cobbly sandy loam, 2 to 9 percent slopes-----	635	(1/)	---------	VIIs-7 (19)	J	3	5	2
DuD	Dune land-------------------	3,720	.4	---------	VIIIe-4 (20, 30)	J	---	5	6
GaE2	Gaviota rocky sandy loam, 15 to 30 percent slopes, eroded---------------------	2,795	.3	---------	VIIe-1 (19)	J	4	5	4
GaF2	Gaviota rocky sandy loam, 30 to 50 percent slopes, eroded--------------------	9,750	.9	---------	VIIe-1 (19)	J	4	5	4
GbF	Gazos clay loam, 30 to 50 percent slopes------------	2,355	.2	---------	VIe-1 (19)	G	1	5	4
GcE	Godde loam, 15 to 30 percent slopes--------------------	2,175	.2	---------	VIe-1 (20)	G	4	5	4
GdF	Godde rocky loam, 30 to 50 percent slopes------------	8,880	.8	---------	VIIe-1 (20)	J	4	5	4
GoD	Gorman sandy loam, 9 to 15 percent slopes------------	900	(1/)	---------	IVe-1 (20)	A	2	1	1
GoD2	Gorman sandy loam, 9 to 15 percent slopes, eroded----	660	(1/)	---------	IVe-1 (20)	A	2	1	1
GoE2	Gorman sandy loam, 15 to 30 percent slopes, eroded----	3,970	.4	---------	VIe-1 (20)	A	2	1	1
GoF2	Gorman sandy loam, 30 to 50 percent slopes, eroded----	10,485	1.0	---------	VIIe-1 (20)	J	2	5	5
GsA	Greenfield sandy loam, 0 to 2 percent slopes----------	8,880	.8	I-1 (19)	IVec-1 (19)	A	2	1	1

See footnote at end of table.

Limitation rating for recreation and related purposes							
						Sewage lagoons	
Play areas	Picnic areas	Lawns and golf fairways	Campsites (intensive)	Paths and trails	Septic tank filter fields	Impound- ment area	Embank- ment
Severe--------	Moderate----	Moderate------	Moderate----	Moderate--------	Severe--------	Moderate---	Moderate.
Severe--------	Moderate----	Moderate------	Moderate----	Moderate--------	Severe--------	Severe-----	Moderate.
Severe--------	Moderate----	Moderate------	Moderate----	Moderate--------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Moderate.
Moderate------	Moderate----	Moderate------	Moderate----	Moderate--------	Severe--------	Slight-----	Moderate.
Slight--------	Slight------	Severe--------	Slight------	Slight----------	Slight--------	Severe-----	Severe.
Severe--------	Moderate----	Severe--------	Moderate----	Slight----------	Moderate------	Severe-----	Severe.
Severe--------	Moderate----	Severe--------	Moderate----	Moderate--------	Moderate------	Severe-----	Severe.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Severe.
Severe--------	Severe------	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Slight.
Severe--------	Severe------	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Moderate.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Moderate.
Severe--------	Moderate----	Moderate------	Moderate----	Slight----------	Severe--------	Severe-----	Slight.
Severe--------	Moderate----	Moderate------	Severe------	Slight----------	Severe--------	Severe-----	Slight.
Severe--------	Severe------	Severe--------	Severe------	Moderate--------	Severe--------	Severe-----	Slight.
Severe--------	Severe------	Severe--------	Severe------	Severe----------	Severe--------	Severe-----	Slight.
Slight--------	Slight------	Slight--------	Slight------	Slight----------	Slight--------	Severe-----	Moderate.

Map symbol	Soil name	Acres	Extent	Capability unit		Vegetative soil group	Range site	Windbreak group	Wildlife group
				Irrigated	Dryland				
			Percent						
GsC	Greenfield sandy loam, 2 to 9 percent slopes---------	30,050	2.9	IIe-1 (19)	IVec-1 (19)	A	2	1	1
GsC2	Greenfield sandy loam, 2 to 9 percent slopes, eroded-	2,185	.2	IIe-1 (19)	IVec-1 (19)	A	2	1	1
GsD2	Greenfield sandy loam, 9 to 15 percent slopes, eroded-----------------------	3,705	.4	IIIe-1 (19)	IVec-1 (19)	A	2	1	1
GuF	Gullied land---------------	8,725	.8	---------	VIIIe-1(19,20,30)	J	---	5	6
HaB2	Hanford loamy sand, 2 to 5 percent slopes, hummocky-	3,625	.3	---------	IVec-1 (19)	B	3	2	2
HbA	Hanford coarse sandy loam, 0 to 2 percent slopes----	7,705	.7	IIs-4 (19)	IVec-1 (19)	A	2	1	1
HbC	Hanford coarse sandy loam, 2 to 9 percent slopes----	40,000	3.8	IIe-1 (19)	IVec-1 (19)	A	2	1	1
HbD	Hanford coarse sandy loam, 9 to 15 percent slopes---	5,230	.5	IIIe-1 (19)	IVec-1 (19)	A	2	1	1
HcA	Hanford sandy loam, 0 to 2 percent slopes-----------	12,940	1.2	IIs-4 (19)	IVec-1 (19)	A	2	1	1
HcC	Hanford sandy loam, 2 to 9 percent slopes-----------	19,625	1.9	IIe-1 (19)	IVec-1 (19)	A	2	1	1
HdC	Hanford gravelly sandy loam, 2 to 9 percent slopes----	7,095	.7	IIe-1 (19)	IVec-1 (19)	A	2	1	2
HfA	Hanford loam, 0 to 2 percent slopes-------------------	720	(1/)	I-1 (19)	IVec-1 (19)	A	2	1	1
HeC	Hanford sandy loam, calcareous variant, 2 to 9 percent slopes--------------	1,390	.1	IIe-1 (19)	IVec-1 (19)	A	2	1	1
HgA	Hesperia loamy fine sand, 0 to 2 percent slopes----	24,520	2.3	IIe-4 (30)	VIIe-4 (30)	B	8	2	2
HgA2	Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky-----------------	17,785	2.0	IIe-4 (30)	VIIe-4 (30)	B	8	2	2
HgB	Hesperia loamy fine sand, 2 to 5 percent slopes----	5,990	.6	IIe-4 (30)	VIIe-4 (30)	B	8	2	2
HkA	Hesperia fine sandy loam, 0 to 2 percent slopes----	45,450	4.3	IIe-4 (30)	VIIe-1 (30)	A	7	1	1
HkB	Hesperia fine sandy loam, 2 to 5 percent slopes----	30,200	2.9	IIe-1 (30)	VIIe-1 (30)	A	7	1	1
HmA	Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes-----------	2,040	.2	IIe-1 (30)	VIIe-1 (30)	A	7	1	1
HnA	Hesperia loam, 0 to 2 percent slopes-----------	2,965	.3	I-1 (30)	VIIc-1 (30)	A	7	1	1
LaE	Las Posas loam, 9 to 30 percent slopes-----------	755	(1/)	IVe-1 (19)	---------	A	2	1	1
LdF	Las Posas-Toomes rocky loams, 30 to 50 percent slopes-------------------	11,680	1.1						
	Las Posas part---------	-----	---	---------	VIIe-1 (19)	J	2	1	1
	Toomes part------------	-----	---	---------	VIIe-1 (19)	J	2	5	4

See footnote at end of table.

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Limitation rating for recreation and related purposes							
						Sewage lagoons	
Play areas	Picnic areas	Lawns and golf fairways	Campsites (intensive)	Paths and trails	Septic tank filter fields	Impound-ment area	Embank-ment
Severe	Moderate	Moderate	Moderate	Slight	Moderate	Severe	Moderate.
Severe	Moderate	Moderate	Moderate	Slight	Moderate	Severe	Moderate.
Severe	Moderate	Moderate	Moderate	Slight	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Variable.
Severe	Severe	Moderate	Severe	Slight	Slight	Severe	Moderate.
Slight	Slight	Slight	Slight	Slight	Slight	Severe	Moderate.
Severe	Moderate	Moderate	Moderate	Slight	Moderate	Severe	Moderate.
Severe	Moderate	Moderate	Moderate	Slight	Severe	Severe	Moderate.
Slight	Slight	Slight	Slight	Slight	Slight	Severe	Moderate.
Severe	Moderate	Moderate	Moderate	Slight	Moderate	Severe	Moderate.
Severe	Severe	Moderate	Moderate	Moderate	Moderate	Severe	Moderate.
Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate.
Severe	Moderate	Moderate	Moderate	Slight	Moderate	Severe	Moderate.
Severe	Severe	Moderate	Severe	Moderate	Slight	Severe	Moderate.
Severe	Severe	Moderate	Severe	Moderate	Slight	Severe	Moderate.
Severe	Severe	Moderate	Severe	Moderate	Slight	Severe	Moderate.
Slight	Slight	Slight	Slight	Slight	Slight	Severe	Moderate.
Moderate	Slight	Moderate	Slight	Slight	Slight	Severe	Moderate.
Slight	Slight	Slight	Slight	Slight	Moderate	Severe	Moderate.
Slight	Slight	Slight	Slight	Slight	Slight	Severe	Moderate.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Slight.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Slight.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Moderate.

Map symbol	Soil name	Acres	Extent	Capability unit		Vege- tative soil group	Range site	Wind- break group	Wild- life group
				Irrigated	Dryland				
			Percent						
LeF	Lebec rocky loam, 15 to 50 percent slopes-----------	7,355	0.7	---------	VIe-1 (20)	J	2	5	5
Me	Merrill sandy loam---------	625	(1/)	IIIe-8 (30)	VIIe-1 (30)	G	6	4	3
MfA	Metz loamy sand, 0 to 2 percent slopes-----------	1,105	.1	IIIs-4 (19)	---------	B	---	2	2
MfC	Metz loamy sand, 2 to 9 percent slopes-----------	2,060	.2	IIIs-4 (19)	---------	B	---	2	2
MgA	Metz loam, 0 to 2 percent slopes------------------	200	(1/)	IIs-4 (19)	---------	A	---	1	1
MgB	Metz loam, 2 to 5 percent slopes------------------	695	(1/)	IIs-4 (19)	---------	A	---	1	1
MhE2	Millsholm rocky loam, 15 to 30 percent slopes, eroded------------------	1,530	.1	---------	VIIe-1 (19)	J	4	5	4
MhF2	Millsholm rocky loam, 30 to 50 percent slopes, eroded------------------	10,720	1.0	---------	VIIe-1 (19)	J	4	5	4
MoA	Mocho sandy loam, 0 to 2 percent slopes-----------	350	(1/)	I-1 (19)	---------	A	---	1	1
MpA	Mocho loam, 0 to 2 percent slopes------------------	365	(1/)	I-1 (19)	---------	A	---	1	1
MpC	Mocho loam, 2 to 9 percent slopes------------------	640	(1/)	IIe-1 (19)	---------	A	---	1	1
MzB	Mohave coarse sandy loam, 2 to 5 percent slopes----	1,335	.1	IIe-1 (30)	VIIe-1 (30)	A	7	1	1
OaC	Oakdale sandy loam, 2 to 9 percent slopes-----------	6,605	.6	---------	IVec-1 (19)	A	2	1	1
ObA	Oak Glen sandy loam, 0 to 2 percent slopes-----------	680	(1/)	---------	IIIc-1 (20)	A	2	1	5
ObC	Oak Glen sandy loam, 2 to 9 percent slopes-----------	8,015	.8	---------	IIIe-1 (20)	A	2	1	5
OcC	Oak Glen gravelly sandy loam, 2 to 9 percent slopes------------------	2,460	.2	---------	IIIe-1 (20)	A	2	2	2
OdA	Oak Glen loam, 0 to 2 percent slopes-----------	540	(1/)	---------	IIIc-1 (20)	A	2	1	5
OdC	Oak Glen loam, 2 to 9 percent slopes-----------	5,150	.5	---------	IIIe-1 (20)	A	2	1	5
OgC	Ojai loam, 2 to 9 percent slopes------------------	1,400	.1	IIIe-1 (19)	---------	A	2	1	1
OgD	Ojai loam, 9 to 15 percent slopes------------------	425	(1/)	IVe-1 (19)	---------	A	2	1	1
OgE	Ojai loam, 15 to 30 percent slopes------------------	1,070	.1	---------	VIe-1 (19)	A	2	1	1
OgF	Ojai loam, 30 to 50 percent slopes------------------	5,630	.5	---------	VIIe-1 (19)	J	2	5	1

See footnote at end of table.

Limitation rating for recreation and related purposes							
						Sewage lagoons	
Play areas	Picnic areas	Lawns and golf fairways	Campsites (intensive)	Paths and trails	Septic tank filter fields	Impound- ment area	Embank- ment
Severe------	Severe------	Severe-------	Severe-----	Severe---------	Severe-------	Severe-----	Moderate.
Slight------	Slight------	Slight-------	Slight-----	Slight---------	Severe-------	Slight-----	Moderate.
Moderate----	Moderate----	Moderate-----	Moderate---	Moderate-------	Slight-------	Severe-----	Severe.
Severe------	Moderate----	Moderate-----	Moderate---	Moderate-------	Moderate-----	Severe-----	Severe.
Slight------	Slight------	Moderate-----	Slight-----	Slight---------	Slight-------	Severe-----	Severe.
Moderate----	Slight------	Moderate-----	Slight-----	Slight---------	Slight-------	Severe-----	Severe.
Severe------	Severe------	Severe-------	Severe-----	Slight---------	Severe-------	Severe-----	Moderate.
Severe------	Severe------	Severe-------	Severe-----	Severe---------	Severe-------	Severe-----	Moderate.
Slight------	Slight------	Slight-------	Slight-----	Slight---------	Moderate-----	Moderate---	Moderate.
Slight------	Slight------	Slight-------	Slight-----	Slight---------	Moderate-----	Moderate---	Moderate.
Severe------	Moderate----	Moderate-----	Moderate---	Slight---------	Moderate-----	Moderate---	Moderate.
Moderate----	Slight------	Moderate-----	Moderate---	Slight---------	Severe-------	Moderate---	Slight.
Severe------	Slight------	Moderate-----	Slight-----	Slight---------	Moderate-----	Moderate---	Moderate.
Slight------	Slight------	Slight-------	Slight-----	Slight---------	Slight-------	Severe-----	Moderate.
Severe------	Slight------	Moderate-----	Slight-----	Slight---------	Moderate-----	Severe-----	Moderate.
Severe------	Moderate----	Moderate-----	Moderate---	Moderate-------	Moderate-----	Severe-----	Moderate.
Slight------	Slight------	Slight-------	Slight-----	Slight---------	Moderate-----	Severe-----	Moderate.
Severe------	Moderate----	Moderate-----	Moderate---	Slight---------	Moderate-----	Severe-----	Moderate.
Severe------	Moderate----	Moderate-----	Moderate---	Slight---------	Severe-------	Moderate---	Slight.
Severe------	Moderate----	Moderate-----	Moderate---	Slight---------	Severe-------	Severe-----	Slight.
Severe------	Severe------	Severe-------	Severe-----	Moderate-------	Severe-------	Severe-----	Slight.
Severe------	Severe------	Severe-------	Severe-----	Severe---------	Severe-------	Severe-----	Slight.

Map symbol	Soil name	Acres	Extent	Capability unit		Vegetative soil group	Range site	Windbreak group	Wildlife group
				Irrigated	Dryland				
			Percent						
OgF2	Ojai loam, 30 to 50 percent slopes, eroded------	860	(1/)	---------	VIIe-1 (19)	J	2	5	1
OzE	Ojai-Zamora loams, 15 to 30 percent slopes--------	1,225	.1						
	Ojai part-------------	-----	---	---------	VIe-1 (19)	A	2	1	1
	Zamora part-----------	-----	---	---------	VIe-1 (19)	A	2	1	1
OhF	Ojai loam, thin surface variant, 30 to 50 percent slopes-------------	1,860	.2	---------	VIIe-1 (19)	J	2	5	1
Po	Pond loam------------------	6,580	.6	---------	VIIs-6 (30)	F	6	3	3
Ps	Pond silty clay loam-------	565	(1/)	---------	VIIs-6 (30)	F	6	3	3
Px	Pond-Oban complex----------	25,450	2.4						
	Pond fine sandy loam-----	-----	---	---------	VIIs-6 (30)	F	6	3	3
	Pond silty clay loam-----	-----	---	---------	VIIs-6 (30)	F	6	3	3
	Oban fine sandy loam-----	-----	---	---------	VIIs-6 (30)	F	6	3	3
RcA	Ramona coarse sandy loam, 0 to 2 percent slopes----	3,105	.3	I-1 (19)	IVec-1 (19)	A	2	1	1
RcB	Ramona coarse sandy loam, 2 to 5 percent slopes----	9,660	.9	IIe-1 (19)	IVec-1 (19)	A	2	1	1
RcC	Ramona coarse sandy loam, 5 to 9 percent slopes----	11,000	1.0	IIIe-1 (19)	IVec-1 (19)	A	2	1	1
RcD	Ramona coarse sandy loam, 9 to 15 percent slopes---	3,670	.4	IVe-1 (19)	IVec-1 (19)	A	2	1	1
RdE2	Ramona sandy loam, 9 to 30 percent slopes, eroded---	24,650	2.4	---------	VIe-1 (19)	A	2	5	1
ReC	Ramona gravelly sandy loam, 2 to 9 percent slopes----	7,020	.7	IIIe-1 (19)	IVec-1 (19)	A	2	2	2
ReE	Ramona gravelly sandy loam, 9 to 30 percent slopes---	4,465	.4	---------	VIe-1 (19)	A	2	5	2
RfB	Ramona loam, 2 to 5 percent slopes------------------	465	(1/)	IIe-1 (19)	IVec-1 (19)	A	2	1	1
RfC	Ramona loam, 5 to 9 percent slopes------------------	375	(1/)	IIIe-1 (19)	IVec-1 (19)	A	2	1	1
Rg	Riverwash------------------	4,485	.4	---------	VIIIw-4 (19, 20, 30)	J	---	5	6
RhF	Rock land------------------	8,730	.8	---------	VIIIs-1 (19, 20, 30)	J	---	5	6
Rm	Rosamond loamy fine sand---	9,540	.9	IIe-4 (30)	VIIe-4 (30)	A	8	2	2
Rm2	Rosamond loamy fine sand, hummocky-----------------	3,540	.3	IIe-4 (30)	VIIe-4 (30)	A	8	2	2
Ro	Rosamond fine sandy loam---	33,130	3.1	IIe-1 (30)	VIIe-1 (30)	A	7	1	1
Rp	Rosamond loam--------------	23,240	2.2	I-1 (30)	VIIc-1 (30)	A	7	1	1
Rr	Rosamond loam, saline-alkali-------------------	11,240	1.1	IIIs-6 (30)	VIIs-6 (30)	F	6	3	3
Rs	Rosamond loam, sandy loam substratum---------------	2,760	.3	I-1 (30)	VIIc-1 (30)	A	7	1	1

See footnote at end of table.

Limitation rating for recreation and related purposes							
						Sewage lagoons	
Play areas	Picnic areas	Lawns and golf fairways	Campsites (intensive)	Paths and trails	Septic tank filter fields	Impound-ment area	Embank-ment
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Slight.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Slight.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Slight.
Moderate	Slight	Severe	Moderate	Slight	Severe	Slight	Moderate.
Moderate	Moderate	Severe	Moderate	Slight	Severe	Slight	Moderate.
Moderate	Slight	Severe	Moderate	Slight	Severe	Slight	Moderate.
Moderate	Moderate	Severe	Moderate	Slight	Severe	Slight	Moderate.
Moderate	Slight	Severe	Moderate	Slight	Severe	Slight	Moderate.
Moderate	Slight	Moderate	Moderate	Slight	Severe	Slight	Slight.
Moderate	Slight	Moderate	Moderate	Slight	Severe	Moderate	Slight.
Severe	Slight	Moderate	Moderate	Slight	Severe	Moderate	Slight.
Severe	Moderate	Moderate	Moderate	Slight	Severe	Severe	Slight.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Slight.
Severe	Moderate	Moderate	Moderate	Slight	Severe	Moderate	Slight.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Slight.
Moderate	Slight	Moderate	Moderate	Slight	Severe	Moderate	Slight.
Severe	Slight	Moderate	Moderate	Slight	Severe	Moderate	Slight.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Severe.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Severe.
Severe	Severe	Moderate	Severe	Moderate	Moderate	Moderate	Moderate.
Severe	Severe	Moderate	Severe	Moderate	Moderate	Moderate	Moderate.
Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate.
Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate.
Slight	Slight	Severe	Slight	Slight	Moderate	Moderate	Moderate.
Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate.

Map symbol	Soil name	Acres	Extent	Capability unit		Vegetative soil group	Range site	Windbreak group	Wildlife group
				Irrigated	Dryland				
			Percent						
Rt	Rosamond silty clay loam----	4,990	0.5	I-1 (30)	VIIc-1 (30)	A	7	1	1
Ru	Rosamond silty clay loam, saline-alkali-------------	1,150	.1	IIIs-6 (30)	VIIs-6 (30)	F	6	3	3
RzF	Rough broken land-----------	4,520	.4	---------	VIIIe-1 (19, 20, 30)	J	---	5	6
Sa	Sandy alluvial land---------	4,680	.4	---------	VIIw-4 (19, 20, 30)	J	3	5	2
ScE	Saugus loam, 15 to 30 percent slopes---------------	1,465	.1	---------	VIe-1 (19)	A	2	1	1
ScF	Saugus loam, 30 to 50 percent slopes---------------	4,515	.4	---------	VIIe-1 (19)	J	2	5	1
ScF2	Saugus loam, 30 to 50 percent slopes, eroded-------	29,950	2.9	---------	VIIe-1 (19)	J	2	5	1
ShE	Sheridan sandy loam, 15 to 30 percent slopes---------	1,170	.1	---------	VIe-1 (20)	G	2	5	5
ShE2	Sheridan sandy loam, 15 to 30 percent slopes, eroded--------------------	745	(1/)	---------	VIe-1 (20)	G	2	5	5
ShF	Sheridan sandy loam, 30 to 50 percent slopes---------	10,240	1.0	---------	VIIe-1 (20)	J	2	5	5
ShF2	Sheridan sandy loam, 30 to 50 percent slopes, eroded--------------------	10,930	1.0	---------	VIIe-1 (20)	J	2	5	5
SoB	Soboba cobbly loamy sand, 2 to 5 percent slopes-----	2,380	.2	---------	VIIs-4 (19)	J	3	5	2
SsA	Sorrento loam, 0 to 2 percent slopes---------------	1,400	.1	I-1 (19)	---------	A	---	1	1
SsB	Sorrento loam, 2 to 5 percent slopes---------------	1,360	.1	IIe-1 (19)	---------	A	---	1	1
Su	Sunrise loamy fine sand-----	905	(1/)	IIIe-8 (30)	VIIe-4 (30)	G	6	4	2
Sv	Sunrise sandy loam----------	5,250	.5	IIIe-8 (30)	VIIe-1 (30)	G	6	4	1
Sw	Sunrise sandy loam, shallow-------------------	1,660	.2	IVe-8 (30)	VIIe-1 (30)	G	6	4	1
Sx	Sunrise loam----------------	1,070	.1	IIIe-8 (30)	VIIe-1 (30)	G	6	4	1
Sy	Sunrise loam, saline-alkali--------------------	730	(1/)	IIIe-8 (30)	VIIs-6 (30)	F	6	3	3
TrF	Temescal-Rock land complex, 30 to 50 percent slopes--	5,050	.5						
	Temescal part----------	-----	---	---------	VIIe-1 (19)	J	4	5	4
	Rock land part----------	-----	---	---------	VIIIs-1 (19)	J	---	5	4
TsF	Terrace escarpments---------	15,600	1.5	---------	VIIe-1 (19), VIIe-1 (20)	J	2	5	6
Tt2	Tray fine sand, hummocky----	3,920	.4	IIIe-4 (30)	VIIe-4 (30)	B	6	2	2
Tu	Tray sandy loam-------------	1,130	.1	IIe-1 (30)	VIIe-1 (30)	A	6	1	1
Tv	Tray sandy loam, saline-alkali--------------------	6,310	.6	IIIs-6 (30)	VIIs-6 (30)	F	6	3	3
Tw	Tray loam, saline-alkali----	2,550	.2	IIIs-6 (30)	VIIs-6 (30)	F	6	3	3
VaA	Vernalis sandy loam, 0 to 2 percent slopes----------	2,120	.2	I-1 (19)	IVec-1 (19)	A	2	1	1
VbA	Vernalis loam, 0 to 2 percent slopes---------------	7,430	.7	I-1 (19)	IVec-1 (19)	A	2	1	1
VbB	Vernalis loam, 2 to 5 percent slopes---------------	990	(1/)	IIe-1 (19)	IVec-1 (19)	A	2	1	1

See footnote at end of table.

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Limitation rating for recreation and related purposes							
						Sewage lagoons	
Play areas	Picnic areas	Lawns and golf fairways	Campsites (intensive)	Paths and trails	Septic tank filter fields	Impound- ment area	Embank- ment
Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Slight.
Moderate	Moderate	Severe	Moderate	Moderate	Moderate	Moderate	Slight.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Variable.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Severe.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Moderate	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Moderate.
Severe	Moderate	Severe	Moderate	Moderate	Slight	Severe	Severe.
Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate.
Moderate	Slight	Moderate	Slight	Slight	Moderate	Moderate	Moderate.
Severe	Severe	Moderate	Severe	Moderate	Severe	Slight	Moderate.
Moderate	Slight	Moderate	Moderate	Slight	Severe	Slight	Moderate.
Severe	Slight	Severe	Moderate	Slight	Severe	Slight	Moderate.
Moderate	Slight	Moderate	Moderate	Slight	Severe	Slight	Moderate.
Moderate	Slight	Severe	Moderate	Slight	Severe	Slight	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Severe.
Severe	Severe	Severe	Severe	Severe	Severe	Severe	Moderate.
Severe	Severe	Severe	Severe	Moderate	Moderate	Moderate	Moderate.
Slight	Slight	Moderate	Slight	Slight	Moderate	Moderate	Moderate.
Slight	Slight	Severe	Slight	Slight	Moderate	Moderate	Moderate.
Slight	Slight	Severe	Slight	Slight	Moderate	Moderate	Moderate.
Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate.
Slight	Slight	Slight	Slight	Slight	Moderate	Moderate	Moderate.
Moderate	Slight	Moderate	Slight	Slight	Moderate	Moderate	Moderate.

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Map symbol	Soil name	Acres	Extent	Capability unit		Vegetative soil group	Range site	Windbreak group	Wildlife group
				Irrigated	Dryland				
			Percent						
VcA	Vernalis clay loam, 0 to 2 percent slopes------------	620	(1/)	I-1 (19)	IVec-1 (19)	A	1	1	1
VsD2	Vista coarse sandy loam, 9 to 15 percent slopes, eroded-------------------	2,640	.3	IVe-1 (19)	---------	G	2	5	1
VsE	Vista coarse sandy loam, 15 to 30 percent slopes-----	2,755	.3	---------	VIe-1 (19)	G	2	5	1
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, eroded-------------------	2,790	.3	---------	VIe-1 (19)	G	2	5	1
VsF	Vista coarse sandy loam, 30 to 50 percent slopes-----	12,410	1.1	---------	VIIe-1 (19)	J	2	5	1
VsF2	Vista coarse sandy loam, 30 to 50 percent slopes, eroded-------------------	14,725	1.4	---------	VIIe-1 (19)	J	2	5	1
WgC	Wyman gravelly loam, 2 to 9 percent slopes-----------	3,340	.3	IIe-1 (19)	IVec-1 (19)	A	2	1	1
WgD	Wyman gravelly loam, 9 to 15 percent slopes--------	1,215	.1	IIIe-1 (19)	IVec-1 (19)	A	2	1	1
WoC	Wyman cobbly loam, 5 to 9 percent slopes-----------	710	(1/)	---------	VIe-7 (19)	A	2	5	2
YoA	Yolo loam, 0 to 2 percent slopes-------------------	2,810	.3	I-1 (19)	---------	A	---	1	1
YoC	Yolo loam, 2 to 9 percent slopes-------------------	3,625	.3	IIe-1 (19)	---------	A	2	1	1
ZaC	Zamora loam, 2 to 9 percent slopes-------------------	615	(1/)	IIe-1 (19)	---------	A	2	1	1
ZaD	Zamora loam, 9 to 15 percent slopes-------------------	165	(1/)	IIIe-1 (19)	---------	A	2	1	1
ZcC	Zamora clay loam, 2 to 9 percent slopes-----------	185	(1/)	IIe-1 (19)	---------	A	1	1	1
	Total-----------------	1,045,575							

1/ Less than one-tenth of 1 percent.

Limitation rating for recreation and related purposes							
						Sewage lagoons	
Play areas	Picnic areas	Lawns and golf fairways	Campsites (intensive)	Paths and trails	Septic tank filter fields	Impoundment area	Embankment
Moderate-----	Moderate-----	Moderate-----	Moderate----	Moderate--------	Moderate------	Moderate----	Moderate.
Severe-------	Moderate-----	Moderate-----	Moderate----	Slight----------	Severe--------	Severe------	Moderate.
Severe-------	Severe-------	Severe-------	Severe------	Moderate--------	Severe--------	Severe------	Moderate.
Severe-------	Severe-------	Severe-------	Severe------	Moderate--------	Severe--------	Severe------	Moderate.
Severe-------	Severe-------	Severe-------	Severe------	Severe----------	Severe--------	Severe------	Moderate.
Severe-------	Severe-------	Severe-------	Severe------	Severe----------	Severe--------	Severe------	Moderate.
Severe-------	Moderate-----	Moderate-----	Moderate----	Moderate--------	Moderate------	Moderate----	Moderate.
Severe-------	Moderate-----	Moderate-----	Moderate----	Moderate--------	Severe--------	Severe------	Moderate.
Severe-------	Moderate-----	Moderate-----	Moderate----	Moderate--------	Moderate------	Moderate----	Moderate.
Slight-------	Slight-------	Slight-------	Slight------	Slight----------	Moderate------	Moderate----	Moderate.
Severe-------	Moderate-----	Moderate-----	Moderate----	Slight----------	Moderate------	Moderate----	Moderate.
Severe-------	Slight-------	Moderate-----	Moderate----	Slight----------	Severe--------	Moderate----	Moderate.
Severe-------	Moderate-----	Moderate-----	Severe------	Slight----------	Severe--------	Severe------	Severe.
Severe-------	Moderate-----	Moderate-----	Moderate----	Moderate--------	Severe--------	Moderate----	Moderate.

soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in the Antelope Valley Area but not in all parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by w, s, and c, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils.

Capability units in California are given Arabic numbers that suggest the chief kind of limitation responsible for placement of the soil in the capability class and subclass. For this reason, some of the units within the subclasses are not numbered consecutively, and their symbols are a partial key to some of the soil features. The numerals used to designate units within the classes and subclasses are these:

0. A problem or limitation caused by sand and gravel in the substratum.
1. An actual or potential erosion hazard.
2. A problem or limitation of wetness caused by poor drainage or flooding.
3. A problem or limitation caused by slow or very slow permeability of the subsoil or substratum.
4. A problem or limitation caused by coarse soil texture or excessive gravel.
5. A problem or limitation caused by fine or very fine textured surface soil.
6. A problem or limitation caused by salt or alkali.
7. A problem or limitation caused by cobblestones, other stones, or rock outcrops.
8. A problem or limitation caused by shallow depth of soil over bedrock or a hardpan.
9. A problem or limitation caused by low fertility or by toxicity (not used in this Area).

Land Resource Areas

In the Antelope Valley Area, capability classification is further refined by designating the land resource area in which the soils in a unit occur. A land resource area is a broad geographic area that has a distinct combination of climate, soils, management needs, and cropping systems. The 48 conterminous States in the Nation have been divided into 156 land resource areas. Parts of three of these areas are in the Antelope Valley Area (fig. 2). These areas and their numbers are Southern California Coastal Plain (19); Southern California Mountains (20); and Sonoran Basin and Range (30). The number of the resource area is added in parentheses, to the class, subclass, and unit designation.

It is necessary to make assumptions that affect management in a land resource area if soils are to be placed consistently in capability units. In the paragraphs that follow, those land resource areas having parts within the Antelope Valley Area are described so that local farming can be related to the resource areas. Following the description of each resource area is a list of those conditions typical of the area that guided placement of the soils in capability classes and units.

Land Resource Area 19.--This land resource area makes up the southwestern and middle parts of the survey area. The soils formed under grasses and oaks in many of the areas. In some areas, however, the vegetation consisted of chaparral and brush that had an understory of annual grasses and forbs. The soils in the southwestern part of the survey area are steep and are on complex marine and nonmarine sedimentary formations. They are in the uplands in areas that are mountainous in many places. The areas are dissected by long, narrow, tributary valleys of the Santa Clara River, many of which have steep sides. Remnants of terraces occur along Castaic Creek and the Santa Clara River, west of Solemint Junction. The middle part of the survey area includes tracts near Agua Dulce, Vincent, Acton, Palmdale, Leona Valley, and the southern and western parts of Antelope Valley.

Throughout the area elevations range from 860 to 3,900 feet. Summers are hot and dry. Winters are cool and moist. Precipitation ranges from about 9 to 16 inches and varies in amount from year to year. Supplemental irrigation is necessary for best growth of most crops.

The major properties that limit use of these soils are coarse texture, steep slopes, pebbles and cobblestones in the soil, and susceptibility to erosion.

The soils in Land Resource Area 19 are placed in capability units on the assumption that these conditions exist:

1. The temperature generally is mild, and the frost-free period ranges from 210 to 300 days. Frosts occur locally, but protection is provided for crops that have a high cash value. Strong winds are likely to cause soil blowing on all sandy soils during the period when leveling is done for irrigation and until crops are established. Soil blowing is particularly a problem in the western part of Antelope Valley and in areas adjacent to the valley. Water erosion also is a hazard. Practices are used for control of soil blowing and to protect the soils from water erosion.

2. Irrigation water is available for most irrigable land from wells, local reservoirs, or sources outside the land resource area. Much of the acreage

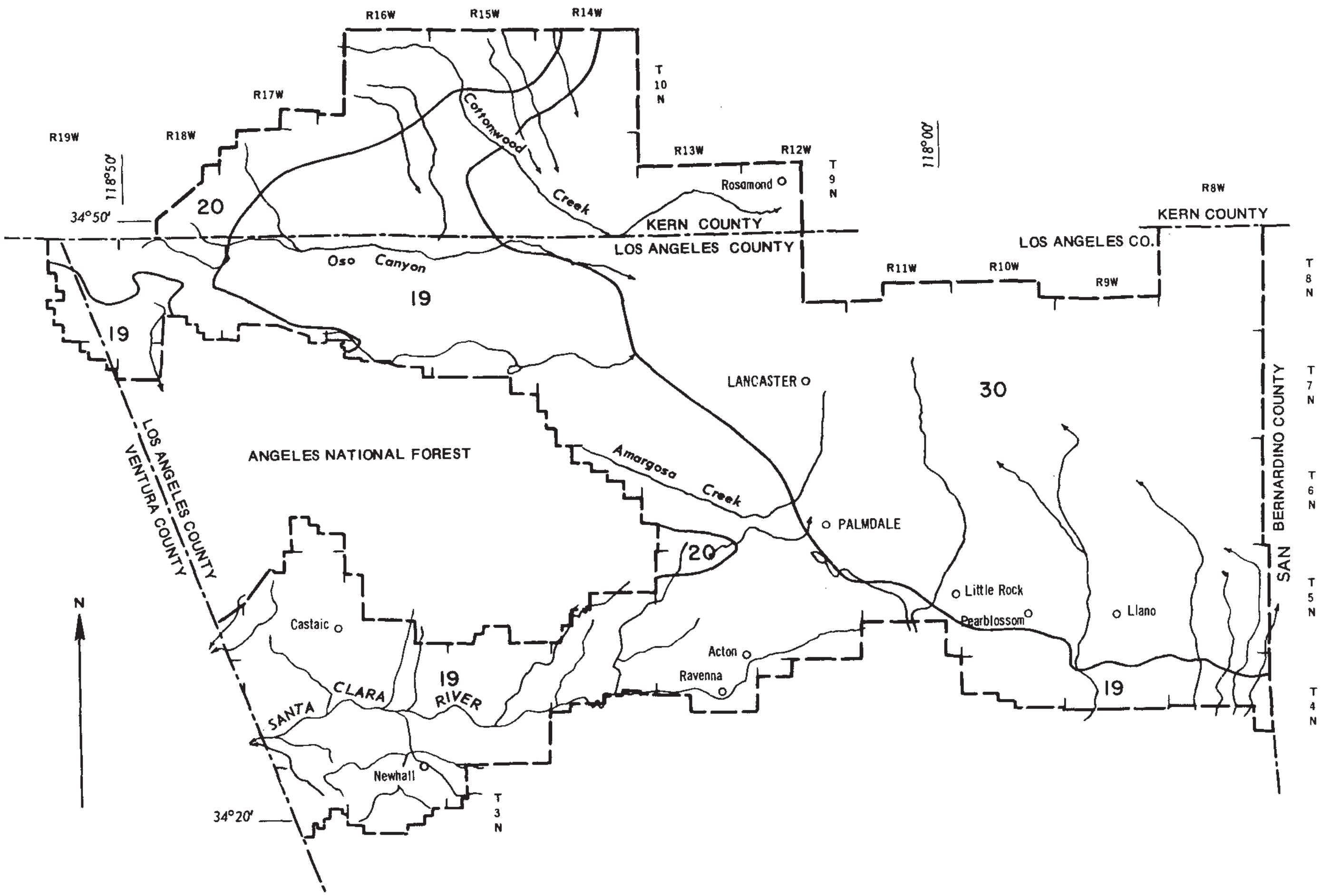

Figure 2.--Land resource areas in the Antelope Valley Area: Southern California Coastal Plain (19); Southern California Mountains (20); Sonoran Basin and Range (30).

intensively cropped is under irrigation. Irrigation is being expanded as quickly as water becomes available. All reasonable means are taken to conserve water. Rainfall generally is adequate so that most crops are not affected by accumulation of salt. If the water supply is salty, drainage and leaching are sufficient to minimize damage to crops that are sensitive to salt. In the western part of Antelope Valley, rainfall is adequate for dryland grains. Only here are the soils of this resource area classified on basis of their capability for dryland crops, as well as for irrigated crops.

3. Drainage and flooding generally are not a problem, though a few areas require further control of flooding. Flooding along the major streams has been reduced through flood-control works. As a result flooding does not now affect management of the soils or the kind of cropping system used.

4. Salt and alkali soils that are light colored and moderately well drained to poorly drained are present in some interior basins. In these areas irrigation water is expensive and suitable outlets for extensive drainage systems are not available. No change in cost of water is expected in the near future. These basin soils therefore are classified on the basis that no more than limited leaching and reduction of salts and alkali are possible.

5. A wide variety of the common field, truck, fruit, and nut crops are grown.

6. A moderately high level of management is used.

Land Resource Area 20.--This resource area, which is dissected by many streams, includes the southern flank of the Tehachapi Mountains and the area near Gorman. It also includes a tract that extends along the edge of Portal Ridge eastward to Pelona Ridge. Many of the valleys in the area are fairly narrow. The resource area is made up of gently sloping to strongly sloping soils, on alluvial fans and terraces, and of moderately steep to steep soils, on foothills, mountains, and fault scarps. Most of the soils formed under brush or chaparral that had an understory of annual grasses and forbs.

Elevations in the resource area range from about 3,000 to 6,500 feet. Precipitation ranges from 12 inches, at the lower elevations, to 20 inches, at the higher elevations. In many years rainfall is marginal for dryland crops. The higher mountain ranges receive some snow in winter, but the snow does not last long. The growing season is 175 to 240 days.

The major factors that limit use of these soils are unreliable and erratic distribution of rainfall,

steep slopes, shallow depth of soil to bedrock, gravel in the soil, low water-holding capacity, and the hazard of erosion.

The soils in Land Resource Area 20 are placed in capability units on the assumption that these conditions exist:

1. Freezing temperatures are common throughout the resource area in winter and spring. Field and orchard crops that are winter hardy are the only suitable crops. Normally protection from frost is provided for orchard crops when the trees are in blossom and at the time the fruit is set. Snow, hail, and thunder showers may adversely affect growth of crops. During the growing season the temperature is warm enough for all the common field and orchard crops to mature.

2. Irrigation water generally is not available, because the supply of water in the resource area is limited and the cost of bringing water into the area is high. If in the future water is delivered to the area at low cost, the capability classification may be modified. Improved use of local water supplies would be too limited, however, to change the capability. The principal source of moisture for growth of crops is rain and snow received in winter and early in spring. Limitations in crop selection caused by lack of moisture are severe.

3. Poorly drained or somewhat poorly drained soil areas provide valuable summer forage when little green feed is available elsewhere. Pasture is the most suitable use for such areas, and artificial drainage is not desirable. The same use is appropriate for areas in stream channels that are subject to flooding but provide supplemental grazing for livestock.

4. The somewhat poorly drained soils are adversely affected by soluble salts in some places. Such areas are too small or otherwise are not important enough to affect the capability classification.

5. Except for limited planting of deciduous orchards, the major crops are grown for forage or to be fed to livestock.

6. The level of management is moderately high.

Land Resource Area 30.--This resource area is the southwestern extension of the Mojave Desert into Los Angeles County. It is an old alluvial basin that includes remnants of old ridges that occur as scattered buttes in the eastern part. Near High Vista granitic uplands are prominent. All intermittent and ephemeral streams in the area drain into Rosamond and Rogers Lakes, which are dry playa lakes. Slopes range from moderate to gentle, at the upper edge of alluvial fans, to nearly level or level, on the valley floor.

Elevations range from a high of 3,100 feet, in the southern part of the resource area, to a low of 2,275 feet at Rosamond Lake. Along the western edge of the area, the elevation is about 2,700 feet, and near Lancaster, it is 2,330 feet. Precipitation ranges from 4 to 9 inches. Summers are hot and dry, and winters are fairly cold. Snowfall is light and stays on the ground for only a short time. Irrigation is necessary for all cultivated crops. In all seasons strong prevailing winds blow from the southwest across the desert.

Some of the major factors that limit use of the soils are low rainfall, accumulation of salts and alkali, low water-holding capacity, and slopes too strong for irrigation. Others are a hardpan of cemented caliche, pebbles and stones throughout the soil profile, the hazard of soil blowing, and nearness of bedrock to the surface.

The soils in Land Resource Area 30 are placed in capability units on the assumption that these conditions exist:

1. Rainfall is inadequate, and the soils are not suitable for cultivated crops unless irrigated. The rainfall is sufficient for limited, sustained growth of native forage plants. Unless irrigated, all soils in the resource area that are suitable for grazing are placed in class VII.

2. Throughout most of the resource area, suitable water for irrigation is available only to limited areas. The water comes mainly from wells, and most of it is of good quality. Not considered in the classification were specific differences in the quality of the water suitable for irrigating the crops commonly grown.

3. Soil blowing is a continuing hazard, particularly on sandy soils.

4. Flooding does not affect management or the cropping systems used, though flood control is needed in some areas.

5. A moderately high level of management is used.

6. The principal crops are alfalfa, small grains, and pasture. Limited areas are planted to orchards and to row crops. Some parts of this resource area are used as desert range, though lack of water for stock limits grazing in places. Edible plants are desert stipa, Indian ricegrass, bromegrass, filaree, as well as other annual grasses and forbs. Other desert plants are bursage, Joshua-trees, juniper, yucca, and cacti.

Management by Capability Units

In the following pages, the capability units in the Antelope Valley Area are described and suggestions for use and management of the soils are given. Soil series names are mentioned in each capability unit, but this does not mean that all mapping units of the series are in that particular unit. The soils in each unit are listed in table 1, p. 66 , and in the "Guide to Mapping Units" at the back of the survey.

Capability unit I-1 (19) irrigated

Soils in this unit are very deep, well drained, and nearly level. They are in the Greenfield, Hanford, Mocho, Ramona, Sorrento, Vernalis, and Yolo series. These soils occupy fairly broad alluvial fans along the drainageways of major streams near Saugus and Newhall. The surface layer ranges from coarse sandy loam to clay loam. Some of the soils have relatively uniform texture throughout the

profile, but others have strata of different texture in the lower part. The Ramona soil has a subsoil of sandy clay loam. Permeability is moderately rapid to moderately slow. Roots can penetrate to a depth of 60 inches or more. Available moisture holding capacity is 7.5 inches or more.

The surface layer ranges from slightly acid to moderately alkaline. The lower layers tend to be more alkaline than the surface layer, and in some areas they are calcareous. Problems related to reaction or to lime are minor. Slopes are less than 2 percent, and the hazard of erosion is none to slight.

All of the soils in this unit are well suited to all crops that are suitable for the climate of the Area.

Furrows, borders, or sprinklers can be used for irrigating, depending on the soil and the particular crop. If water is applied by borders or furrows, the soil needs to be smoothed or leveled to a uniform grade. Also, before deep leveling cuts are made, the soil depth should be checked. The length of runs for furrows and borders and the rate of application by sprinklers varies with the soil texture and the head of water. Enough water needs to be applied to wet the soil evenly to the rooting depth of the crop grown. A soil auger, shovel, or metal probe can be used to check the depth that water penetrates. Application needs to be timed so that the crop receives enough water but not too much.

All soils in this unit need green manure, crop residues, and other organic matter that help to maintain favorable soil structure, tilth, plant nutrients, and infiltration rates. Except for soils in orchards, crop rotation should be used to control the buildup of pests and disease and loss of plant nutrients that generally occur if a single crop is grown for a number of years. If tillage is kept to a minimum, structure and infiltration are improved.

Nitrogen is needed for all crops except alfalfa and other legumes, which respond to phosphate fertilizer. Barnyard and poultry manures should be added if available.

Capability unit I-1 (30) irrigated

In this unit are very deep, well drained or moderately well drained, nearly level soils. These soils are in the Hesperia and Rosamond series. They are on low alluvial fans near Lancaster. The surface layer ranges from loam to silty clay loam. The soils are uniform throughout the profile or are stratified. Permeability is moderately rapid to moderate. Roots can penetrate to a depth of 60 inches or more. Available water holding capacity is 7.5 inches or more. The surface layer is slightly acid to moderately alkaline, and the lower part of the profile is calcareous.

These soils are well suited to all irrigated crops that are suitable for the climate of the Area. They are not suited to dryland crops because rainfall is very low.

Furrows, borders, or sprinklers can be used for irrigating, depending on the soil and the crop. Strong seasonal winds, however, somewhat limit the use of sprinklers. Enough water must be applied to meet the needs of the crop. In places the soil needs to be smoothed or leveled to get uniform distribution of the water.

All soils in this unit need green manure, crop residues, and other organic matter that help to maintain favorable soil structure, tilth, plant nutrients, and infiltration rates. Keeping tillage to a minimum and leaving stubble on the areas during the windy season help to hold the soil in place.

Nitrogen is needed for all crops except alfalfa and other legumes, which respond to phosphate fertilizer.

Capability unit IIe-1 (19) irrigated

Soils in this unit are very deep, well drained to moderately well drained, and gently sloping to moderately sloping. They are in the Greenfield, Hanford, Mocho, Ramona, Sorrento, Vernalis, Wyman, Yolo, and Zamora series. These soils occupy alluvial fans and terraces throughout the southwestern part of the survey area. The surface layer ranges from coarse sandy loam to clay loam. Some of the soils have fairly uniform texture throughout the profile, but others have slight to moderate increase of clay in the subsoil. Permeability is moderately rapid to moderately slow. Roots can readily penetrate to a depth of 60 inches or more. Available moisture holding capacity is more than 5.0 inches.

The surface layer ranges from slightly acid to moderately alkaline. Some of the soils are calcareous in the lower part, and others are calcareous throughout. Lime chlorosis is not a problem. Slopes range from 2 to 9 percent, and the hazard of erosion is slight to moderate.

These soils are well suited to all crops that are suitable for the climate of the Area. Moderate care is needed, however, for control of erosion.

Sheet and rill erosion can be controlled by applying water for irrigation in borders or furrows placed across the slope and by using heads that are small and applying the water in a way that it does not erode the soil. The furrows should be moderate in length. On slopes of more than 2 percent, sprinkler irrigation is probably the most practical way to apply water. The sprinkler system should be designed so that the water is applied at a rate no greater than the intake rate of the soil.

Fertility can be increased and soil structure improved if all crop residues are returned to the soils. Most crops on these soils respond to nitrogen and phosphate fertilizer, but alfalfa and other legumes respond to phosphate fertilizer alone. Orchard crops may also require certain trace elements.

Capability unit IIe-1 (30) irrigated

In this unit are very deep, well drained or moderately well drained soils that are nearly level to gently sloping. These soils are in the Hesperia, Mohave, Rosamond, and Tray series. They are on

alluvial fans near Lancaster and Palmdale. The surface layer ranges from coarse sandy loam to fine sandy loam. The Hesperia and Tray soils have fairly uniform texture throughout the profile. The Mohave soils have a sandy clay loam subsoil. Permeability ranges from moderately rapid to moderately slow. Roots can penetrate to a depth of 60 inches or more. Available water holding capacity is 5.5 to 11.0 inches.

The surface layer ranges from medium acid to mildly alkaline. Slopes are 0 to 5 percent. The hazard of water erosion is none to moderate, and the hazard of wind erosion is slight to moderate.

These soils are used for all irrigated crops suited to the climate of the Area. They are not suited to dryland crops, because rainfall is very low.

Irrigation water can be applied by furrows, borders, or sprinklers. If furrows or borders are used, erosion can be controlled by placing the furrows or borders across the slope. Keeping stubble or other mulch on the surface during periods of high wind provides protection from soil blowing. All of the soils need green manure, crop residues, and other organic matter that improve fertility and maintain soil structure.

Nitrogen and phosphate fertilizers are needed for all crops except alfalfa. Alfalfa responds to phosphate fertilizer.

Capability unit IIe-4 (30) irrigated

Soils in this unit are very deep, excessively drained to moderately well drained, and nearly level to gently sloping. They are in the Adelanto, Cajon, Hesperia, and Rosamond series. These soils are on alluvial fans and terraces near Lancaster and northeast of Palmdale.

The surface layer ranges from loamy sand to fine sandy loam. Some of the soils contain sufficient gravel to interfere with tillage. The subsoil and substratum range from fine sand to light silty clay loam. Some of the soils have fairly uniform texture throughout the profile, and others have strata of different texture. Permeability is moderate to moderately rapid. Roots can penetrate to a depth of 60 inches or more. Available moisture holding capacity is more than 5.0 inches. The surface layer is slightly acid to mildly alkaline. Slopes range from 0 to 5 percent, and the hazard of soil blowing is slight to high.

Many irrigated crops are grown on these soils, among them alfalfa, barley, oat hay, dry onions, pasture, melons, potatoes, sugar beets, and wheat. Peaches, pears, almonds, and other orchard crops also are grown. The orchard crops may need protection from frost.

Strong winds in spring are likely to damage such new plantings as sugar beets. Some fields left bare have been reworked by wind, and additional leveling and smoothing are needed before the areas can be irrigated again. On many areas of the Hesperia and Rosamond soils, hummocks have been formed by the wind. These hummocks must be smoothed before irrigation water can be applied again. Protection for new seedlings of alfalfa can be provided by seeding the alfalfa in standing grain stubble in the fall. Returning all crop residues to the soil, and where feasible, leaving stubble mulch on the surface help to keep the soil from blowing. Leaving weeds on abandoned fields helps to hold the soil in place.

Windbreaks can be used around farmsteads and the boundaries of fields to provide protection from the wind. Among the plants suitable for windbreaks are bamboo, reedgrass (Arundo donax), Arizona cypress, athel or evergreen tamarisk, and Aleppo pine.

Furrows, borders, or sprinklers can be used for irrigating, depending on the soil and the crop. Sprinklers have the advantage of keeping the soil wet, thus reducing wind damage to new plantings. Enough irrigation water needs to be applied to wet the soil evenly down to the rooting depth of the crop grown. Soil depth should be checked before deep leveling cuts and fills are made. Wasting water through overirrigation should be avoided.

All soils in this unit need green manure, crop residues, and crop rotations that maintain organic matter and supply nutrients. Poultry and barnyard manures also are good fertilizers and should be used if available. Most crops on these soils require fertilizer that contains nitrogen and phosphate. Alfalfa and other legumes respond to phosphate fertilizer.

Capability unit IIw-2 (19) irrigated

Chino loam is the only soil in this unit. It is very deep, is somewhat poorly drained, and is nearly level. The areas are in Leona Valley, in Potrero Canyon, and near Agua Dulce. The surface layer is loam, and the substratum is silty clay loam and clay loam. This soil is fairly uniform throughout. The profile is moderately alkaline to very strongly alkaline and is slightly effervescent to violently effervescent. Many salt or gypsum crystals are in the lower part of the profile. Permeability is moderately slow. Roots can readily penetrate to a depth of 60 inches or more. Available moisture holding capacity is 10 to 12 inches. Slope is less than 2 percent, runoff is very slow, and in places water stands in ponds on the soil in spring.

This soil is wet and is used for meadow pasture. Drainage and leaching are needed before the areas can be used for irrigated crops. When reclaimed, this soil is suited to most crops adapted to the climate. The soil is not suited to deep-rooted tree crops. In Leona Valley, and in some other places, where stream channels have cut deep, drainage is improved.

Tile drains or ditches are needed to lower the seasonal water table and to aid in leaching the salts and alkali from the soil. Adding gypsum or other soil amendments also helps to reclaim the soil. Borders, furrows, or sprinklers can be used for irrigating. Extra water needs to be applied once or twice each season to leach excess salts from the soil. Limited land leveling or smoothing can be done. Care is needed to avoid exposing the unfavorable substratum.

This soil needs crop residues and other organic matter that help to improve soil structure, increase infiltration rates, and increase soil fertility. Most crops on this soil respond to nitrogen and phosphate fertilizer, but alfalfa and other legumes respond to phosphate fertilizer alone.

Capability unit IIs-4 (19) irrigated

In this unit are very deep, well drained or somewhat excessively drained soils that are nearly level to gently sloping. These soils are in the Hanford and Metz series. The surface layer is coarse sandy loam to loam. Below is sandy loam to sand. Permeability is moderately rapid to rapid. Roots can penetrate to a depth of more than 60 inches. Available water holding capacity is 5.0 to 7.5 inches. The soil is slightly acid to mildly alkaline. Slopes are 0 to 5 percent, and the hazard of erosion is none to slight.

The soils in this unit are suited to all crops that are suitable for the climate of the Area.

Irrigation water can be applied by furrows, borders, or sprinklers. The water needs to be applied more often than on soils in capability unit I-1 (19) irrigated. The water-holding capacity of the soils in this unit is low, however, and less water must be used in each application. Before extensive leveling is done, each area must be investigated. Some areas are stratified with sand and gravel, and irrigating such areas would be difficult.

Turning under all cover crops, green-manure crops, and crop residues improves soil structure and increases fertility. Growing crops in rotation reduces buildup of insect pests and diseases. Most crops on these soils respond if nitrogen and phosphate fertilizers are added. Alfalfa and other legumes respond if phosphate fertilizer is added.

Capability unit IIIe-1 (19) irrigated

Soils in this unit are moderately deep to very deep, are well drained, and are gently sloping to strongly sloping. These soils are in the Balcom, Castaic, Greenfield, Hanford, Ojai, Ramona, Wyman, and Zamora series. They are on toe slopes and alluvial fans and terraces near Saugus and Newhall. The surface layer ranges from gravelly sandy loam to silty clay loam, and the material below from sandy loam to clay loam. Some areas are eroded. Permeability ranges from moderately rapid to moderately slow. Roots can penetrate to a depth between 26 and 60 inches or more. Available water holding capacity ranges from 5.0 to 11.0 inches.

The soils in this unit are slightly acid to moderately alkaline. Slopes range from 2 to 15 percent, but in many places slopes are 2 to 9 percent. The hazard of further erosion is slight to moderate.

Suitable irrigated crops for these soils are alfalfa, almonds, pasture, oat hay, small grains, dry onions, peaches, pears, and potatoes. The soils also are suited to dryland barley, oats, and wheat, and to range.

Irrigation water must be applied carefully for control of erosion. If furrows are used, they should be of moderate length. The heads should be small and apply the water in a way that it does not erode the soil. On the steeper soils, such as the Zamora, the furrows should be placed across the slope or on the contour. Except for Greenfield and Hanford soils, cuts made when land leveling and smoothing are done should be no more than 12 or 18 inches deep. The subsoil in some areas has less favorable texture or structure, and irrigation would be difficult in such areas. Sprinkler irrigation is probably the most practical way to apply water on the steeper soils. The water should be applied at a rate no greater than the intake rate of the soils.

Most irrigated crops respond if nitrogen and phosphate fertilizers are applied. Green manure, crop residues, and crop rotations are needed that improve tilth and that maintain the supply of plant nutrients and content of organic matter. Barnyard and poultry manures should also be applied if available.

Dryfarmed areas need contour tillage, use of stubble mulch, contour stripcropping, and crop rotations. These practices help to conserve moisture, to control sheet and rill erosion, and to keep gullies from forming. Growth of small grains can be improved in years when the supply of moisture is favorable by adding nitrogen.

Capability unit IIIe-1 (20) dryland

In this unit are very deep, well-drained soils that are gently sloping to moderately sloping. These soils are in the Oak Glen series. The surface layer is sandy loam, gravelly sandy loam, or loam. Permeability is moderate to moderately rapid. Roots can penetrate to a depth of more than 60 inches. Available water holding capacity is 4.0 to 10.0 inches. Reaction ranges from slightly acid to medium acid. Slopes are 2 to 9 percent, and the hazard of erosion is slight to moderate.

Irrigation water is not available in areas of these soils. The soils are therefore used for dryland hay, grain, pasture, and range.

Planting crops on the contour or across the slope and use of stubble mulch help to control runoff and to reduce erosion. The soils need crop residues and other organic matter that help to improve soil structure, fertility, and infiltration rates. The response to nitrogen fertilizer is good in years when rainfall is favorable and questionable to poor in years when rainfall is unfavorable.

Capability unit IIIe-4 (30) irrigated

This unit consists of very deep, excessively drained to moderately well drained soils that are nearly level to strongly sloping. These soils are in the Cajon and Tray series. They are on alluvial fans and basin rims near Lancaster and Acton. The surface layer is fine sand, loamy sand, or loamy fine sand. Permeability ranges from rapid to moderately slow. Roots can readily penetrate to a

depth of 60 inches or more. Available water holding capacity ranges from 3.0 to 5.5 inches.

The surface layer is neutral to very strongly alkaline. In the subsoil and below in most of the soils, lime occurs and the reaction ranges from mildly alkaline to very strongly alkaline. Slopes are 0 to 15 percent. The hazard of soil blowing is moderate to high, and protection from both wind and water erosion are needed.

Most irrigated crops adapted to the survey area can be grown on soils of this unit. Orchard crops grow better on the steeper slopes because air drainage is more favorable.

The coarse texture of these soils makes them droughty and susceptible to wind and water erosion. Many of the areas have hummocks on them formed by the wind. The hummocks make preparing the areas for irrigation costly. Sprinklers are the best way to provide irrigation for soils of this unit.

These soils should never be clean tilled for any length of time, nor should they be left bare. Growing small grains or row crops intensively reduces the supplies of organic matter and plant nutrients and increases the hazard of soil blowing. Small grains therefore should be grown only in rotation when establishing plantings of alfalfa. Leaving stalks, leaves, and husks on the ground after harvest and the use of stubble mulch and rough tillage help to control soil blowing. On fields left fallow, strips of vegetation can be used to reduce soil blowing, or plants can be left growing.

Windbreaks can be used around farmsteads and the boundaries of fields to provide protection from the wind. Among the plants suitable for windbreaks are Aleppo pine, athel or evergreen tamarisk, Arizona cypress, bamboo, and reedgrass (Arundo donax).

Most crops on these soils respond to nitrogen and phosphate fertilizers. Alfalfa and other legumes respond to phosphate fertilizer. Barnyard and poultry manures can be used for improved growth of crops and to help build up the content of organic matter in the soils.

Capability unit IIIe-8 (30) irrigated

In this unit are moderately deep, moderately well drained soils that are nearly level. These soils are in the Merrill and Sunrise series. They are on the basin rim west and northwest of Lancaster. The surface layer is loamy fine sand, sandy loam, or loam, and the subsoil is loam or light clay loam. Permeability of the subsoil is moderately slow. The depth that roots can penetrate is limited by a hardpan made up of lime-cemented layers. Roots can penetrate deeper than about 40 inches only with difficulty. Available water holding capacity is about 3.5 to 6.0 inches. Fertility is low.

Soils in this unit have a moderately alkaline surface layer. Their subsoil is moderately alkaline to strongly alkaline. Some of the soils have slight accumulations of salts and alkali throughout. Slopes are 0 to 2 percent, and the hazard of soil blowing is slight to moderate.

Suitable crops for irrigated areas of these soils are alfalfa, oat hay, pasture, dry onions, potatoes, sugar beets, small grains, and melons. Shallow-rooted plants that tolerate salts and alkali are suitable for the saline-alkali soils.

Because depth of the soil is limited, irrigation water needs to be applied carefully. Frequent, light applications of water must be made to prevent a perched water table and reduced aeration. Saline-alkali areas need to be leached thoroughly to remove excess salts. If leveling is done, deep cuts that would expose the hardpan should be avoided. Cementation of the hardpan varies from place to place. Roots and water cannot penetrate the hardpan in a few places, though in most places they can penetrate it with difficulty. The soil can be made more permeable to roots and water and the effective depth can be increased by use of ripping to shatter the pan.

The soils in this unit need green manure, crop residues, and crop rotations that maintain soil structure and increase the supplies of organic matter and plant nutrients. Barnyard and poultry manures also are needed. Most crops on these soils respond if nitrogen is applied. Alfalfa and other legumes respond to phosphate fertilizer.

Capability unit IIIs-4 (19) irrigated

The soils in this unit are very deep, somewhat excessively drained, and nearly level to moderately sloping. They are in the Metz series. These soils are near Saugus and Newhall along the drainageways of major streams and on alluvial fans. The texture is loamy sand in the upper part of the profile, but it is sand below a depth of 36 inches. A few fine pebbles occur throughout the profile. Permeability of the subsoil is rapid. Roots can penetrate to a depth of 60 inches or more. Available water holding capacity is about 4 to 5 inches. The surface layer and subsoil are neutral in reaction. Slopes are 0 to 9 percent, and the hazard of erosion is slight.

These soils are suited to such irrigated crops as alfalfa, almonds, barley, oat hay, potatoes, wheat, dry onions, green onions, and carrots.

Coarse texture makes these soils droughty and rapidly permeable. Frequent irrigation therefore is needed, and sprinklers are well suited. Overirrigation should be avoided. If borders or furrows are used to apply irrigation water, the runs should be short. In this way the water is distributed evenly throughout the root zone. Stubble mulching can be used in dryfarmed areas to conserve moisture and to control erosion.

The soils in this unit need crop rotations, crop residues, and large amounts of barnyard and other manures that help to improve tilth and to maintain structure and the content of organic matter. Most crops on these soils respond if nitrogen and phosphate fertilizers are applied. Alfalfa and other legumes respond to phosphate fertilizer alone.

Capability unit IIIs-6 (30) irrigated

Soils in this unit are very deep, are moderately well drained, and are slightly to moderately affected by salts and alkali. They are in the Rosamond and Tray series. These soils occupy areas in the basin of Antelope Valley. The surface layer is sandy loam, loam, or silty clay loam, and the layers below are stratified. Permeability is moderate to moderately slow. Roots can penetrate to a depth of more than 60 inches. The available water holding capacity is 5.5 to 12.0 inches. Reaction is moderately alkaline to very strongly alkaline. Soluble salts and sodium salts occur throughout the profile. Slopes are 0 to 2 percent, and the hazard of erosion is slight to moderate.

If the salts in the soil have been reduced, the soils in this unit are suited to most irrigated crops grown in the survey area.

Irrigation can be by furrows, borders, or sprinklers. Applying more water than the crops require leaches out excess salts and keeps the salt content to a minimum. In some areas tile drains may be needed to aid the leaching process. Such soil amendments as gypsum or soil sulfur may also be required in leaching when reclaiming the alkali soils.

These soils need crop residues or other organic matter that improves tilth and structure and increases the supply of plant nutrients. Most crops on these soils respond if nitrogen and phosphate fertilizers are applied. Alfalfa and other legumes respond if phosphate fertilizer alone is applied.

Capability unit IIIc-1 (20) dryland

Very deep, well-drained, nearly level soils of the Oak Glen series are in this unit. These soils are on alluvial fans in the western part of the survey area. The surface layer is sandy loam to loam, and the substratum is sandy loam to fine sandy loam. Permeability is moderate to moderately rapid. Roots can penetrate readily to a depth of 60 inches or more. Available water holding capacity is 6 to 10 inches. Reaction is slightly acid to medium acid. Slopes are 0 to 2 percent, and the hazard of erosion from wind and water is none to slight.

These soils are suited to such dryland small grains as wheat and barley. They also are suited to range. Water is lacking for irrigation.

Stubble mulching and contour stripcropping are needed on these soils. Crop residues and other organic matter that improve tilth and fertility also are needed.

In years when the supply of soil moisture is favorable, most plants on these soils respond if nitrogen is applied.

Capability unit IVe-1 (19) irrigated

Soils in this unit are moderately deep to very deep, well drained, and moderately sloping to moderately steep. They are in the Ayar, Balcom, Castaic, Las Posas, Ojai, Ramona, and Vista series. These soils are in the uplands on toe slopes and terraces near Castaic Junction and Neenach and south of Palmdale. The surface layer is silty clay loam, loam, or coarse sandy loam, and the material below ranges from sandy loam to silty clay loam. Some areas are eroded. Permeability is moderately rapid to slow. In most places roots can penetrate to a depth of from about 24 inches to more than 60 inches. Available moisture holding capacity is 2.5 to 11.0 inches.

In soils of this unit, the surface layer is slightly acid to moderately alkaline and the material below is slightly acid to moderately alkaline. Slopes range from 5 to 30 percent, and the hazard of further erosion is slight to high.

Suitable irrigated crops for these soils are alfalfa, almonds, barley, oat hay, pasture, peaches, pears, and wheat.

Stubble mulching and tillage across the slope are needed to protect the areas from sheet and rill erosion and to keep small gullies from forming. Excess water can be safely removed from these soils and erosion reduced through use of diversions that have stabilized outlets.

Sprinklers can be used for irrigating these soils. The sprinkler system should be designed so that the water is applied at a rate no greater than the intake rate of the soil. In this way excessive runoff is prevented and erosion controlled. Most crops on these soils respond to additions of phosphate and nitrogen fertilizers.

Capability unit IVe-1 (20) dryland

This unit consists of very deep, well-drained soils that are strongly sloping. These soils are in the Gorman series. They occur mainly near Gorman. The surface layer is sandy loam, and the subsoil is sandy clay loam. Some areas are eroded. Permeability is moderately slow. Roots can penetrate to a depth of more than 60 inches. Available water holding capacity is 7.5 to 9.0 inches. Reaction is neutral to strongly acid. Slopes range from 9 to 15 percent, and the hazard of further erosion is moderate.

Lack of irrigation water makes these soils better suited to dryland crops and pasture than to other uses.

These soils should be kept under permanent cover 4 years out of 6 for control of erosion. In addition all planting and harvesting should be on the contour or across the slope and stubble or other kinds of mulch should be left on the surface. The soils need crop residues, green manure, or other kinds of organic matter that help to maintain tilth and the supply of plant nutrients. The response of crops to fertilizer is questionable because rainfall in the area is erratic.

Capability unit IVe-4 (30) irrigated

Arizo loamy fine sand, 0 to 2 percent slopes, is the only soil in this unit. It is very deep and is excessively drained. The areas are along Little Rock Creek Wash and Big Rock Creek Wash, east and

west of Littlerock. The substratum is very gravelly loamy sand. Permeability is very rapid. Roots can penetrate to a depth of 60 inches in places, but they generally are confined to the upper 20 or 36 inches because of the excessive gravel in the substratum. Available water holding capacity is between 4.0 and 3.0 inches. The soil is neutral to mildly alkaline throughout. The hazard of soil blowing is high.

At present this soil is used for range in spring. The soil can be irrigated under careful management that controls soil blowing. Alfalfa, almonds, oat hay, and pasture would be suitable irrigated crops. Row crops would not be suited, because of the hazard of soil blowing and the low available water holding capacity.

A cover of stubble or other mulch should be kept on this soil. Small grains should be grown only in rotation to establish new plantings of alfalfa or of pasture plants.

Sprinklers are best to use for irrigating this soil. Overirrigation should be avoided. Areas that have wind hummocks on them require extra preparation. If land leveling or smoothing is done to prepare areas of this soil for irrigating, deep cuts should be avoided.

Legumes on this soil respond if fertilizer that contains phosphate is applied. Nonlegumes benefit if nitrogen fertilizer is added.

Capability unit IVe-8 (30) irrigated

Sunrise sandy loam, shallow, is the only soil in this unit. It is moderately well drained and is nearly level. The areas are northwest and west of Lancaster on the basin rim. The substratum is heavy loam and loam. Permeability is moderately slow. Penetration of roots is limited by a hardpan made up of lime-cemented material, and roots can therefore penetrate only to a depth of about 10 to 15 inches. Available water holding capacity ranges from 2.0 to 3.0 inches. The surface layer is mildly alkaline to moderately alkaline. Below the material is mildly alkaline to strongly alkaline. Slopes are less than 2 percent, and the hazard of erosion is moderate.

This soil is suitable for irrigated alfalfa, barley, oat hay, dry onions, pasture, and wheat.

Shattering the hardpan in this soil by ripping makes the soil more permeable. It also increases the depth to which roots can penetrate. The saline-alkali areas need to be thoroughly leached to remove soluble salts.

This soil is well suited to sprinkler irrigation. Frequent light applications of water are required to prevent a perched water table and reduced aeration. Land leveling or smoothing should be avoided.

Green manure, crop rotations, and crop residues that help to improve tilth and structure and that increase the supply of plant nutrients are needed on this soil. Also needed are barnyard and poultry manures. Most crops on this soil respond if nitrogen and phosphate fertilizers are applied. Alfalfa responds to phosphate fertilizer alone.

Capability unit IVec-1 (19) dryland

Very deep, well-drained and somewhat excessively drained, nearly level to strongly sloping soils are in this unit. These soils are in the Greenfield, Hanford, Hanford variant, Oakdale, Ramona, Vernalis, and Wyman series. They are mostly on alluvial fans in the western part of Antelope Valley. The surface layer ranges from loamy sand to gravelly clay loam, and the subsoil, from gravelly loamy coarse sand to clay loam. Some areas are hummocky and others are eroded. Permeability is moderately rapid to moderately slow. Roots can penetrate to a depth of about 60 inches or more. Available water holding capacity ranges from about 4.5 to 10.5 inches. Most of the soils are slightly acid to moderately alkaline. Slopes are 0 to 15 percent, and the hazards of soil blowing and of water erosion are none to high.

These soils are used for such dryland crops as wheat, barley, and almonds. Oats also are planted occasionally. Orchard crops do not grow well.

This part of the resource area receives less rain than other parts. Rainfall generally is unreliable and varies widely from the average. As a result, growth of crops is poor in many years. On slopes of less than 2 percent, soil blowing can be reduced by placing strips of wind-resistant crops crosswise to the general direction of prevailing winds. These soils also need stubble mulch, contour strips, and cultivation across the slope. These help to conserve moisture and reduce soil blowing. Deep furrow listing also helps to reduce soil blowing. In years when the supply of moisture is favorable, most crops on these soils respond if nitrogen fertilizer is added.

Capability unit IVs-0 (19) irrigated

Soils in this unit are very deep, excessively drained, and nearly level to moderately sloping. They are in the Cortina series. These soils are on alluvial fans near Castaic. The surface layer is sandy loam, and the substratum is very gravelly sandy loam that is very cobbly in many places. Permeability is rapid. In places roots can penetrate to a depth of 60 inches, but roots generally are confined to the upper part of the profile because of excessive gravel in the substratum. Available water holding capacity is 2.5 to 4.0 inches. Reaction is neutral to mildly alkaline. Slopes are 0 to 9 percent, and the hazard of erosion is slight to moderate.

These soils are used mainly for range, dryland small grains, irrigated alfalfa, and pasture, but green onions and carrots are grown in some places.

Because the soils in this unit are droughty and rapidly permeable, frequent irrigation is required. Sprinklers can be used to apply irrigation water, but overirrigation should be avoided. If borders and furrows are used to apply irrigation water, the runs should be short and enough water must be applied to wet the soils evenly throughout the root zone. Cuts made in leveling the soils should be no more than 18 inches deep. Gravel would be exposed, and irrigating the areas would be difficult.

The soils in this unit need crop rotations, crop residues, and additions of barnyard and other manures that improve tilth and structure and increase the content of organic matter. Most crops on these soils respond if nitrogen and phosphate fertilizer are applied. Alfalfa and other legumes respond to phosphate fertilizer alone.

Capability unit VIe-1 (19) dryland

Moderately deep to very deep, well-drained, strongly sloping to steep soils are in this unit. These soils are in the Balcom, Castaic, Gazos, Ojai, Ramona, Saugus, Vista, and Zamora series. They are mostly in the northwestern and southwestern parts of the survey area and south of Palmdale. The surface layer ranges from coarse sandy loam to silty clay loam. The subsoil is similar to the surface layer in texture, though the Ojai, Ramona, and Zamora soils have a subsoil of clay loam or sandy clay loam. Some of the soils are gravelly, a few rocks crop out on some soils, and some of the soils are eroded. Permeability of the subsoil ranges from moderately rapid to moderately slow. Roots can penetrate to a depth between about 20 and 60 inches. Available water holding capacity is about 2.5 to 11.0 inches.

Most soils in this unit are slightly acid to moderately alkaline. Slopes range from 9 to 50 percent, and the hazard of further erosion is moderate to high.

These soils are suitable for range and for wildlife habitat. Because of the slopes, the soils are not suited to cultivated crops. A cover of close-growing plants and plant residues must be kept on the areas at all times. Range management practices are needed that maintain or improve the plant cover and that help to control erosion.

Capability unit VIe-1 (20) dryland

This unit consists of shallow to very deep, well-drained soils that are moderately steep to steep. These soils are in the Anaverde, Godde, Gorman, Lebec, and Sheridan series. They occupy high elevations, where the temperature is cool, mainly near Lebec and Gorman. The surface layer is sandy loam or loam, and some of the soils are eroded. In places rock crops out. All of the soils except the Gorman are fairly uniform throughout the profile. The Gorman soil has a subsoil of sandy clay loam. Permeability is moderately rapid to moderately slow. Roots can penetrate to a depth of 14 to more than 60 inches. Available moisture holding capacity is 2.0 to 9.0 inches.

The soils in this unit are medium acid to moderately alkaline. Slopes range from 15 to 30 percent in most places, but they are as steep as 50 percent in some areas. The hazard of further erosion is moderate to high.

These soils are well suited to range and wildlife habitat. The growing season is shorter than on soils in capability unit VIe-1 (19) dryland.

Keeping a cover of close-growing plants on these soils helps to slow runoff and to reduce the hazard of erosion. Stands of forage can be improved through seeding and fertilizing and by removing the brush from the areas.

Capability unit VIe-7 (19) dryland

Wyman cobbly loam, 5 to 9 percent slopes, is the only soil in this unit. It is well drained, is very deep, and has a subsoil of gravelly clay loam. The areas are near Acton and Agua Dulce. Permeability is moderate. Roots can penetrate to a depth of more than 60 inches. Available water holding capacity is 5.5 to 7.0 inches. Reaction is slightly acid to neutral. The hazard of erosion is slight to moderate.

Enough cobblestones are on the surface of this soil to hinder tillage. The soil is suited, however, to range and pasture.

Keeping a cover of close-growing plants on this soil helps to protect it from erosion. The soil is difficult to work into furrows, but sprinklers can be used for irrigating. Stands of forage can be improved by seeding adapted species of plants. Range plants respond if fertilizers are added.

Capability unit VIIe-1 (19) dryland

Soils in this unit are well drained to excessively drained, shallow to very deep, and strongly sloping to very steep. These soils are in the Agua Dulce, Amargosa, Balcom, Castaic, Gaviota, Las Posas, Millsholm, Ojai, Ojai variant, Saugus, Temescal, Toomes, and Vista series. The land type, Terrace escarpments, also is in this unit. The areas are near Agua Dulce, Castaic, and Saugus. Texture of the surface layer is coarse sandy loam to silty clay loam. Stones are on the surface of some of the soils, and rocks crop out on others. Some of the soils are eroded. Most of the soils are uniform in texture throughout the profile. The Ojai soils, however, have a subsoil of clay loam, and the Agua Dulce soil has a subsoil of very cobbly and gravelly clay loam. Permeability is moderately rapid to moderately slow. Roots can penetrate to a depth of 12 to more than 60 inches. Available water holding capacity is 1.0 to 11.0 inches. Reaction ranges from slightly acid to moderately alkaline. Slopes range from 9 to 65 percent, and the hazard of further erosion is moderate to very high.

These soils are suited to range and wildlife habitat. The slopes and erosion hazard make seeding and applying fertilizer uneconomical. Keeping an adequate cover of plants on the surface slows runoff and helps to control erosion. These soils should not be overgrazed and should be protected from fire.

Capability unit VIIe-1 (20) dryland

Shallow to very deep, well-drained, steep soils are in this unit. These soils are in the Anaverde, Godde, Gorman, and Sheridan series. The land type, Terrace escarpments, also is in this unit. These soils occupy high elevations where the temperature is cool. The surface layer is sandy loam or loam,

and rocks crop out on the Anaverde and Godde soils. Some of the soils are eroded. Permeability is moderately rapid to moderately slow. Roots can penetrate to a depth of 14 to more than 60 inches. Available water holding capacity ranges from 2.0 to 9.0 inches. Reaction is strongly acid to neutral. Slopes range from 30 to 50 percent, and the hazard of further erosion is high to very high.

These soils are used for range, wildlife habitat, and watershed. The growing season is shorter than on soils of capability unit VIIe-1 (19) dryland.

The slopes and erosion hazard make seeding and fertilizing these soils uneconomical. Keeping a cover of low-growing plants on these soils slows runoff and helps to control erosion. The areas should not be overgrazed and should be protected from fire.

Capability unit VIIe-1 (30) dryland

The soils in this unit are shallow to very deep, well drained or moderately well drained, and nearly level to gently sloping. They are in the Adelanto, Hesperia, Merrill, Mohave, Rosamond, Sunrise, and Tray series. These soils occupy areas throughout the desert part of the survey area. The surface layer is coarse sandy loam, sandy loam, or fine sandy loam. In some areas fine-textured strata occur in the profile. Permeability is moderately rapid to moderately slow. Roots penetrate to a depth of 10 to 40 inches in the Merrill and Sunrise soils, and to more than 60 inches in the others. Available water holding capacity is 2.0 to 11.0 inches. Reaction ranges from medium acid to very strongly alkaline. Slopes range from 0 to 5 percent, and the hazard of water erosion is none to slight. The hazard of soil blowing is slight to moderate.

If these soils were irrigated, they would be in capability units I-1, IIe-1, IIIe-8, and IVe-8. Low rainfall makes the soils suited only to limited grazing in spring. The vegetative cover on the areas is limited and should not be removed, for areas left bare are subject to soil blowing.

Capability unit VIIe-4 (30) dryland

In this unit are moderately well drained to excessively drained, nearly level to moderately steep soils. These soils are in the Adelanto, Arizo, Cajon, Calvista, Hesperia, Hi Vista, Rosamond, Sunrise, and Tray series. They are on alluvial fans, flood plains, terraces, and uplands in tracts scattered throughout the area near Lancaster and other parts of the Mojave Desert. The surface layer ranges from fine sand to gravelly sandy loam, and the material below, from very gravelly loamy sand to sandy clay loam. Some of the soils have hummocks on them, and some have outcrops of rock. Permeability ranges from very rapid to moderately slow. Roots can penetrate to a depth of 15 to 60 inches or more. Available water holding capacity is 1.5 to 10.0 inches.

Most of these soils are slightly acid to moderately alkaline in the surface layer and mildly alkaline to strongly alkaline and calcareous below. Slopes are mostly 0 to 9 percent, but they are as steep as 30 percent in some areas. The hazard of soil blowing is slight to high.

These soils are similar to those in capability units IIe-4, IIIe-4, and IVe-4 irrigated. They are suitable for limited grazing in spring. The intake of moisture from summer storms of high intensity is fairly good, and under good management growth of forage is moderate. Leaving all vegetation on the areas and protecting the range from fire and overgrazing help to protect the soils from erosion.

Capability unit VIIw-4 (19, 20, 30) dryland

Only Sandy alluvial land is in this unit. It occurs throughout the survey area. This land consists of stratified, unconsolidated alluvium that varies widely in texture, reaction, drainage, and available water holding capacity. The areas are subject to frequent flooding during or immediately after heavy rain.

Sandy alluvial land is suited to range, wildlife, and water supply. A cover of vegetation needs to be kept on the areas to protect them from erosion. Dikes and levees can be used to provide protection from flooding.

Capability unit VIIs-4 (19) dryland

Soboba cobbly loamy sand, 2 to 5 percent slopes, is the only soil in this unit. It is very deep, is excessively drained, and is gently sloping. This soil is on alluvial fans in the southwestern part of the survey area. The substratum is very cobbly loamy coarse sand. Permeability is very rapid. Roots can penetrate to a depth of 60 inches, but they generally are confined to the upper part of the profile because of the large number of pebbles and cobblestones in the lower part. Available water holding capacity is 2.0 to 3.0 inches. Reaction ranges from neutral to mildly alkaline. Slopes are 2 to 5 percent, and the hazard of water erosion is slight. The hazard of soil blowing is slight to moderate.

This soil is suited to limited use for range in spring. It also is suitable for wildlife purposes. Keeping a cover of vegetation on the areas and protecting the areas from overgrazing help to control erosion.

Capability unit VIIs-6 (30) dryland

Moderately deep to very deep, moderately well drained, nearly level soils are in this unit. These soils are in the Oban, Pond, Rosamond, Sunrise, and Tray series. They are in valley basins northeast and northwest of Lancaster. The surface layer ranges from sandy loam to silty clay loam. Permeability is moderate to slow. Roots can penetrate to a depth of 60 inches or more in all except the Sunrise soils. In these soils a lime-cemented hardpan at a depth of 24 to 39 inches restricts root penetration. Available water holding capacity ranges from 4.0 to 12.0 inches.

The surface layer of these soils is moderately alkaline to very strongly alkaline, and the subsoil is very strongly alkaline. The soils are calcareous throughout, and most of them are moderately to strongly saline-alkali. Slopes are less than 2 percent, and the hazard of water erosion is none to slight. The hazard of soil blowing is none to moderate.

Soils in this unit are suitable for spring range and for wildlife habitat. A protective cover of vegetation should be kept on these soils. The areas also need to be protected from overgrazing and from fire.

Because of fine texture of the subsoil, large accumulations of salts and alkali, and lack of suitable outlets for drainage, the potential for reclaiming these soils is very poor. If in the future the expense of drainage, adding soil amendments, and leaching could be justified, these soils could be successfully reclaimed. Then, most crops adapted to the Mojave Desert could be grown.

Capability unit VIIs-7 (19) dryland

Cortina cobbly sandy loam, 2 to 9 percent slopes, is the only soil in this unit. It is very deep, is excessively drained, and has a substratum of very cobbly or very gravelly sandy loam. Permeability is rapid. Roots can penetrate to a depth of 60 inches or more. Available water holding capacity is 2 to 3 inches. The hazard of erosion is slight.

Because of the many pebbles and cobblestones in this soil and its low available water holding capacity, this soil is suitable mainly for limited range. A cover of vegetation should be kept on the areas to help protect the soil from erosion.

Capability unit VIIc-1 (30) dryland

In this unit are moderately deep to very deep, moderately well drained to well drained soils that are nearly level. These soils are in the Hesperia and Rosamond series. They are on alluvial fans near Lancaster or are on the basin rim north and west of Lancaster. The surface layer is silty clay loam or loam. Permeability is moderately rapid to moderately slow. Roots can penetrate to a depth of 60 inches or more. Available water holding capacity is about 8.0 to 12.0 inches.

These soils are mildly alkaline to moderately alkaline in the surface layer and are mildly alkaline to strongly alkaline to a depth of 60 inches or more. Slopes are less than 2 percent, and the hazard of erosion is slight.

Because these soils are in the desert where rainfall is low, they are used only for range in spring. Protection from overgrazing is needed.

Capability unit VIIIe-1 (19, 20, 30) dryland

Soils in this unit are moderately deep, severely eroded, and steep to very steep. They are in the Castaic and Saugus series. Also in this unit are the land types Gullied land and Rough broken land. Areas of this unit occur throughout the survey area. The surface layer is loam to silty clay loam. Soft shale and sandstone or weakly consolidated sediment underlie the areas. Hard bedrock does not occur. Permeability is moderate to moderately slow.

Most areas of this unit are nearly bare, and only patches of thick brush are on other areas. Nearly all of the rain that falls runs off, and it washes large amounts of soil material onto lower areas. Slopes range from 30 to 75 percent, and the hazard of further erosion is very high.

The soils and land types in this unit have no practical value for agriculture. The areas are used for watershed, recreation, and wildlife purposes. Structures and planting are needed for protection against gullying and sloughing and to prevent the washing of soil material onto lower areas. Any plant cover should be protected.

Capability unit VIIIe-4 (20, 30) dryland

Only the land type Dune land is in this unit. It consists of sand that has been blown about by the wind and piled into hills or ridges. The areas are rolling to hilly. Patches of brush cover some areas and have stabilized the drifting sand. The hazard of further soil blowing is high.

Dune land has no value for agriculture. It is suitable for wildlife and recreation uses. The vegetation on the areas should not be disturbed, for then the dunes would again be on the move.

Capability unit VIIIw-4 (19, 20, 30) dryland

Only Riverwash is in this unit. It consists of sand and gravel in channels of the larger streams and their tributaries. The areas occur throughout the survey area. The soil material is excessively drained, though this land commonly is flooded part of the year. Sorting, scouring, and redeposition of soil material are likely. Fresh alluvial material is continually added and removed through flooding and streambank erosion. The areas are free of vegetation or are sparsely covered by annuals, brush, and willows that may be removed when the flow of the streams is heavy.

This land type has no value for agriculture, but it is valuable as infiltration beds and for storing underground water. Riverwash also is a source of commercial sand and gravel for use as fill material or for other uses. If channels were alined and the streambanks protected, adjacent areas would benefit.

Capability unit VIIIs-1 (19, 20, 30) dryland

Only Rock land is in this unit. It is on mountains throughout the survey area. Exposed bedrock covers from 50 to 90 percent of each area. The soil between the rocks is very shallow. Slopes range from 9 to 55 percent. The hazard of erosion is slight. Some areas have a thin cover of grass on them, and others are bare. The vegetation is mostly scattered annual grasses and forbs, but brush covers some areas.

Rock land has little value for agriculture other than watershed protection and use for wildlife habitat. Some areas are used for recreation.

Estimated Yields

This section gives estimated yields of the principal crops grown in the county and some of the management practices used to obtain those yields. The estimates are given in table 2 and are for crops that are irrigated or dryfarmed. These estimates are based on observations made by soil scientists who surveyed the Area, on comparisons with similar soils, and on information furnished by farmers. They also are based on suggestions furnished by crop specialists in the Agricultural Stabilization and Conservation Service, the Federal Extension Service, the soil Conservation Service, the California Agricultural Experiment Station, and by the Los Angeles County Agricultural Commissioner. Federal and county census records and crop data also were reviewed and considered. Only those soils that are widely used for crops are listed in the table.

Some of the factors considered in making the estimates were the soil and climatic requirements of the crop; the probable yield and quality of the crop under the moderately high level of management commonly used in the survey area; and for perennial crops, the probable productive life of the crop. The estimates for dryland crops assume that rainfall is likely to vary widely from month to month and from year to year. More complete information about the characteristics of the soils and about management that will help the farmer in considering a site for a particular crop can be obtained from the sections "Descriptions of the Soils" and "Management by Capability Units."

The crops listed in table 2 are those that are most commonly grown, and the yields shown are representative of the most extensive area of the soil listed. Special crops or crops grown intermittently on a small acreage are excluded. The yields in the table are averages, and in any one year actual yields may be higher or lower than those listed. The yields also do not apply to individual parcels of land, and care is needed in applying the ratings to a specific site.

Information provided in this section on yields and management practices will be most useful immediately upon release of this survey. New developments in crop breeding, use of fertilizer, tillage, and control of insects and diseases will make obsolete some information on management. Newer and better practices can always be substituted, and the State and Federal farm advisory services can provide the latest information available.

The management commonly practiced for most crops grown in the survey area includes proper preparation of the seedbed and control of weeds, diseases, insects, and pests. The best adapted and most desirable varieties of crops are grown, and preparation of the seedbed, planting, harvesting, pruning, tillage, irrigation and other management are done at the proper time and in the proper order.

In the paragraphs that follow are given the cropping sequence, rates of planting and fertilization, and amounts of irrigation water assumed when the yields for the crops specified in table 2 were estimated.

Alfalfa. A typical cropping sequence consists of 6 to 9 years of alfalfa, 1 year of small grain, and 2 years of row crops. The alfalfa seed, which should be a variety that is aphid resistant, is inoculated prior to seeding and is planted at a rate of 20 to 25 pounds per acre. Alfalfa requires 20 pounds of nitrogen and 40 to 50 pounds of phosphorus per acre for new plantings and 100 pounds of phosphorus per acre annually for established stands. On sandy soils 3 to 5 tons of poultry or barnyard manure also is required at the time of seeding, and 5 to 10 tons per acre is needed annually for established stands. Alfalfa requires about 5.0 to 6.0 acre-feet of irrigation water per acre annually. The size of irrigation borders and the design of sprinkler systems depend upon the type of soil.

Almonds. Two or more varieties of almonds are required in an orchard for cross pollination. These trees require 100 to 150 pounds of nitrogen per acre annually, or 1 pound per tree. In some areas zinc also may be needed. Almond trees require 2.0 to 3.0 acre-feet of irrigation water per acre annually. They also must be protected from frost. A cover crop of barley, seeded at the rate of 30 pounds per acre, helps to improve penetration of water and also helps to reduce erosion.

Barley. A suitable cropping sequence consists of 2 years of barley, 1 year of a row crop, and 6 to 9 years of alfalfa. After treatment with a fungicide, California Mariout or Blanco Mariout seed is planted at the rate of 100 pounds per acre. Barley requires 75 to 100 pounds of nitrogen per acre before planting or at the time of planting. Sandy soils also require about 3 to 5 tons of manure per acre each year. Barley generally requires about 1.5 to 2.0 acre-feet of irrigation water per acre each year, but on saline-alkali soils the

requirement is 2.5 to 3.0 acre-feet of irrigation water annually.

Oat hay. A typical cropping sequence is 2 years of oat hay, 1 year of a row crop or a small grain, and 6 to 9 years of alfalfa. Sierra oat seed is planted at the rate of 75 to 100 pounds per acre. Oat hay requires about 75 to 100 pounds of nitrogen per acre annually. The nitrogen can be applied before planting or at the time of planting. Wet, saline-alkali, or sandy soils also require 4 to 6 tons of barnyard or poultry manure. Oat hay generally requires from 1.5 to 2.0 acre-feet of irrigation water per acre annually, though oat hay on saline-alkali soils requires 2.5 to 3.0 inches of water per acre annually.

Onions. A suitable cropping sequence consists of 2 years of dry onions, 1 year of a small grain, and 6 to 9 years of alfalfa. Fiesta or Whites onion seed is planted at a rate of 4 to 6 pounds per acre. From 96 to 120 pounds of nitrogen, 42 to 50 pounds of phosphorus, and 40 to 50 pounds of potassium generally are required per acre per year. On saline-alkali soils, however, 72 to 96 pounds of nitrogen, 32 to 42 pounds of phosphorus, and 30 to 40 pounds of potassium and 5 to 7 tons of barnyard or poultry manure per acre annually are required. Also needed on sandy soils and on sloping soils, is 3 to 5 tons of manure per acre annually. Irrigation water generally is required in amounts of 2.5 to 3.0 acre-feet of water per acre annually. Saline-alkali soils, however, require an additional 0.5 acre-foot of irrigation water each year for leaching purposes.

Pasture. A suitable cropping sequence consists of 5 to 7 years of pasture, 1 year of small grain, and 2 years of row crops. Seeding generally is done at rates of about 2 to 4 pounds of Lahontan alfalfa or narrowleaf trefoil and 5 to 8 pounds of Akaroa orchardgrass or Goar fescue per acre. On saline-alkali soils planting is done at rates of 2 to 3 pounds of Moapa alfalfa or common alfalfa or narrowleaf trefoil and 8 pounds of Alta fescue or Goar fescue, or 15 bushels of sprigs of Coastal bermudagrass or 3 pounds of giant bermudagrass seed per acre. Sandy soils require 2 to 4 pounds of Lahontan alfalfa and 15 bushels of Coastal bermudagrass sprigs or 3 pounds of giant bermudagrass seed per acre. Most soils require 100 to 150 pounds of nitrogen per acre annually, but sandy soils require 125 to 175 pounds of nitrogen per acre per year. Sandy soils and saline-alkali soils also require 3 to 5 tons of barnyard or poultry manure per acre annually. Pasture plants generally require from 4.0 to 5.0 acre-feet of irrigation water per acre each year, but on saline-alkali soils an additional 0.5 acre-feet of water is required annually for leaching purposes.

Peaches or pears. These trees require 120 to 160 pounds of nitrogen, 54 to 62 pounds of phosphorus, and 96 to 113 pounds of potassium per acre each year. They also require 3.5 to 4.5 acre-feet of irrigation water annually. Planting about 30 pounds of barley seed per acre as a cover crop helps to protect the soils from erosion.

Potatoes. A typical cropping sequence for soils that have a texture of sandy loam to clay loam consists of 2 years of potatoes, 1 year of a small grain, and 6 to 9 years of alfalfa. The cropping sequence on sandy soils and on soils that have a hardpan is 1 year of potatoes, 1 year of a small grain, and 6 to 10 years of alfalfa. Certified Kennebec or White Rose seed potatoes that have been treated are planted at the rate of about 1,500 to 2,000 pounds per acre. At the time of planting, from 120 to 160 pounds of nitrogen and 60 to 100 pounds of phosphorus per acre annually generally are applied as a side dressing. Sandy soils also need 3 to 5 tons of barnyard or poultry manure per acre each year. From 3.5 to 4.0 acre-feet of irrigation water per acre is needed for potatoes each year.

Sugar beets. A typical cropping sequence consists of 2 years of sugar beets, 1 year of a small grain, and 6 to 9 years of alfalfa. On soils that have a hardpan, sugar beets are grown for only 1 year. Seeding is done at the rate of 7 pounds of seed per acre. Sugar beets require 50 pounds of nitrogen at the time of planting, 75 pounds after thinning, 75 pounds 30 days later, and 100 to 150 pounds of phosphorus broadcast prior to listing. Also, about 4.5 to 5.5 acre-feet of irrigation water is required for each acre annually.

Wheat. A typical cropping sequence consists of 2 years of wheat, 1 year of a row crop, and 6 to 9 years of alfalfa. On saline-alkali soils, however, wheat is grown for 2 years, alfalfa for 6 to 9 years, and pasture for 7 to 9 years. On sandy soils, on soils that have a hardpan, or on strongly sloping soils, the typical sequence is 2 years of wheat and 8 to 10 years of alfalfa. After treatment with a fungicide, certified Ramona 50, Gains, or Nainari seed is planted at the rate of 75 to 100 pounds per acre. About 100 to 120 pounds of nitrogen is needed per acre annually, and 2 to 3 tons of barnyard or poultry manure per acre also is needed. Sandy soils require 120 to 140 pounds of nitrogen and 3 to 5 tons of manure per acre each year.

Dryland barley and wheat. A suitable cropping sequence is 1 year of barley and 1 year of fallow. After treatment with a fungicide, planting is done at rates of about 35 to 50 pounds of clean Vaughn barley seed or 25 to 35 pounds of clean Ramona wheat seed per acre. In years when rainfall is favorable, wheat and barley respond if 20 to 40 pounds of nitrogen per acre per year is applied, but the response to fertilizer is not certain.

Storie Index Rating[2]

The soils of the area are listed in alphabetic

[2]By Dr. Frank F. Harradine, Professor of Soil Morphology, Department of Soils and Plant Nutrition, University of California, Davis, Calif.

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TABLE 2.--ESTIMATED AVERAGE ACRE YIELDS OF THE

[Estimates are for the most extensive area of the listed soil, and only soils crop is not grown or is not of

Soil	Irrigated crops				
	Alfalfa (hay)	Almonds	Barley (grain)	Oat hay	Onions (dry)
	Tons	Pounds	100-pound sacks	Tons	50-pound sacks
Adelanto loamy sand, 2 to 5 percent slopes	6-8	2/ 800-1,000	15-23	2-3	500-800
Adelanto coarse sandy loam, 0 to 2 percent slopes	8-10	2/ 1,000-1,500	23-35	3-4	800-1,200
Adelanto gravelly sandy loam, 2 to 5 percent slopes	5-7	2/ 800-1,000	15-23	2-3	500-800
Arizo loamy fine sand, 0 to 2 percent slopes	4-6	2/ 600-800	15-23	2-3	-------
Ayar clay loam, 5 to 15 percent slopes	---	-------	-----	---	-------
Cajon loamy sand, 0 to 2 percent slopes	6-8	2/ 1,000-1,500	15-23	2-3	500-800
Cajon loamy sand, 2 to 9 percent slopes	6-8	2/ 1,000-1,500	15-23	2-3	500-800
Cajon loamy sand, loamy substratum, 0 to 2 percent slopes	8-10	2/ 1,000-1,500	15-23	2-3	500-800
Castaic silty clay loam, 2 to 9 percent slopes	---	-------	-----	---	-------
Castaic silty clay loam, 9 to 15 percent slopes	---	-------	-----	---	-------
Castaic-Balcom silty clay loams, 9 to 15 percent slopes	---	-------	-----	---	-------
Castaic-Balcom silty clay loams, 15 to 30 percent slopes	---	-------	-----	---	-------
Chino loam	3/ 8-10	-------	3/ 23-35	3/ 3-4	3/ 800-1,200
Cortina sandy loam, 0 to 2 percent slopes	4-6	600-800	15-23	2-3	500-800
Cortina sandy loam, 2 to 9 percent slopes	4-6	600-800	15-23	2-3	500-800
Gorman sandy loam, 9 to 15 percent slopes	---	-------	-----	---	-------
Gorman sandy loam, 9 to 15 percent slopes, eroded	---	-------	-----	---	-------
Greenfield sandy loam, 0 to 2 percent slopes	8-10	2/ 1,000-1,500	23-35	3-4	800-1,200
Greenfield sandy loam, 2 to 9 percent slopes	8-10	2/ 1,000-1,500	23-35	3-4	500-800
Greenfield sandy loam, 2 to 9 percent slopes, eroded	8-10	2/ 1,000-1,500	23-35	3-4	250-500
Greenfield sandy loam, 9 to 15 percent slopes, eroded	6-8	2/ 800-1,000	10-15	2-3	250-500
Hanford coarse sandy loam, 0 to 2 percent slopes	6-8	2/ 1,500-1,700	23-35	3-4	800-1,200
Hanford coarse sandy loam, 2 to 9 percent slopes	6-8	2/ 1,500-1,700	23-35	3-4	500-800
Hanford coarse sandy loam, 9 to 15 percent slopes	4-6	2/ 800-1,000	10-15	2-3	250-500
Hanford sandy loam, 0 to 2 percent slopes	8-10	2/ 1,500-1,700	23-35	4-5	1,200-1,500
Hanford sandy loam, 2 to 9 percent slopes	8-10	2/ 1,500-1,700	23-35	4-5	800-1,200
Hanford gravelly sandy loam, 2 to 9 percent slopes	6-8	2/ 1,000-1,500	15-23	3-4	500-800
Hanford loam, 0 to 2 percent slopes	8-10	-------	35-40	4-5	1,200-1,500
Hanford sandy loam, calcareous variant, 2 to 9 percent slopes	8-10	-------	23-35	4-5	800-1,200
Hesperia loamy fine sand, 0 to 2 percent slopes	6-8	2/ 1,000-1,500	15-23	2-3	500-800
Hesperia loamy fine sand, 2 to 5 percent slopes	6-8	2/ 1,000-1,500	15-23	2-3	500-800

See footnotes at end of table.

PRINCIPAL IRRIGATED CROPS AND DRYLAND CROPS
that are widely used for crops are listed. Absence of information indicates the
sufficient importance in the soil area]

Irrigated crops--Continued						Dryland crops	
Pasture	Peaches	Pears	Potatoes	Sugar beets	Wheat	Barley (grain)	Wheat
Animal-unit-months 1/	Tons	Tons	100-pound sacks	Tons	100-pound sacks	100-pound sacks	100-pound sacks
8-12	2/ 8-12	2/ 15-25	200-300	10-15	15-25	---	---
12-18	2/ 8-12	2/ 15-25	300-400	20-30	25-33	---	---
6-8	2/ 5-8	2/ 10-15	200-300	10-15	15-25	---	---
8-12	---	-----	-------	-----	15-25	---	---
----	---	-----	-------	-----	-----	3-8	2-5
8-12	2/ 5-8	2/ 10-15	200-300	-----	15-25	---	---
8-12	2/ 5-8	2/ 10-15	200-300	-----	15-25	---	---
8-12	2/ 8-12	2/ 15-25	200-300	-----	15-25	---	---
----	----	-----	-------	-----	-----	8-12	5-8
----	----	-----	-------	-----	-----	3-8	2-5
----	----	-----	-------	-----	-----	8-12	5-8
----	----	-----	-------	-----	-----	5-8	2-5
3/ 18-20	----	-----	-------	-----	3/ 33-35	---	---
8-12	----	-----	-------	-----	15-25	---	---
8-12	----	-----	-------	-----	15-25	---	---
----	----	-----	-------	-----	-----	12-18	8-11
----	----	-----	-------	-----	-----	12-18	8-11
18-20	2/ 8-12	2/ 15-25	300-400	20-30	25-33	12-18	8-11
12-18	2/ 8-12	2/ 15-25	300-400	20-30	25-33	12-18	8-11
12-18	2/ 8-12	2/ 15-25	300-400	20-30	25-33	8-12	5-8
12-18	2/ 8-10	2/ 15-20	200-300	-----	15-25	8-12	5-8
12-18	2/ 12-14	2/ 25-30	400-450	15-20	15-25	8-12	5-8
12-18	2/ 12-14	2/ 25-30	300-400	15-20	15-25	8-12	5-8
12-18	5-8	10-15	150-200	-----	10-15	8-12	5-8
12-18	2/ 12-14	2/ 25-30	400-450	20-30	25-33	12-18	8-11
12-18	2/ 12-14	2/ 25-30	300-400	15-20	25-33	12-18	8-11
12-18	2/ 8-12	2/ 15-25	<150	-----	15-25	12-18	8-11
18-20	----	-----	400-450	20-30	33-35	12-18	8-11
12-18	----	-----	-------	15-20	25-33	12-18	8-11
8-12	2/ 8-12	2/ 15-25	200-300	15-20	15-25	---	---
8-12	2/ 8-12	2/ 15-25	200-300	10-15	15-25	---	---

Soil	Irrigated crops				
	Alfalfa (hay)	Almonds	Barley (grain)	Oat hay	Onions (dry)
	Tons	Pounds	100-pound sacks	Tons	50-pound sacks
Hesperia fine sandy loam, 0 to 2 percent slopes	8-10	2/ 1,500-1,700	23-35	3-4	1,200-1,500
Hesperia fine sandy loam, 2 to 5 percent slopes	8-10	2/ 1,500-1,700	23-35	3-4	800-1,200
Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes	10-11	2/ 1,500-1,700	23-35	3-4	1,200-1,500
Hesperia loam, 0 to 2 percent slopes	10-11	-----------	35-40	3-4	1,200-1,500
Las Posas loam, 9 to 30 percent slopes	-----	-----------	-----	---	-----------
Merrill sandy loam	4/ 6-8	-----------	4/ 15-23	4/ 2-3	250-500
Metz loamy sand, 0 to 2 percent slopes	6-8	800-1,000	15-23	2-3	500-800
Metz loamy sand, 2 to 9 percent slopes	6-8	800-1,000	15-23	2-3	250-500
Metz loam, 0 to 2 percent slopes	6-8	1,000-1,200	23-35	3-4	500-800
Metz loam, 2 to 5 percent slopes	6-8	1,000-1,200	23-35	3-4	500-800
Mocho sandy loam, 0 to 2 percent slopes	10-11	1,500-1,700	35-40	4-5	1,200-1,500
Mocho loam, 0 to 2 percent slopes	10-11	1,500-1,700	35-40	4-5	1,200-1,500
Mocho loam, 2 to 9 percent slopes	10-11	1,500-1,700	35-40	4-5	1,000-1,200
Mohave coarse sandy loam, 2 to 5 percent slopes	6-8	-----------	15-23	2-3	250-500
Oakdale sandy loam, 2 to 9 percent slopes	-----	-----------	-----	---	-----------
Oak Glen sandy loam, 0 to 2 percent slopes	-----	-----------	-----	---	-----------
Oak Glen sandy loam, 2 to 9 percent slopes	-----	-----------	-----	---	-----------
Oak Glen gravelly sandy loam, 2 to 9 percent slopes	-----	-----------	-----	---	-----------
Oak Glen loam, 0 to 2 percent slopes	-----	-----------	-----	---	-----------
Oak Glen loam, 2 to 9 percent slopes	-----	-----------	-----	---	-----------
Ojai loam, 2 to 9 percent slopes	6-8	1,000-1,500	23-35	3-4	250-500
Ojai loam, 9 to 15 percent slopes	6-8	800-1,000	15-23	3-4	-----------
Ojai-Zamora loams, 15 to 30 percent slopes (Zamora part only)	-----	-----------	-----	---	-----------
Ramona coarse sandy loam, 0 to 2 percent slopes	6-8	2/ 1,000-1,500	23-35	3-4	800-1,200
Ramona coarse sandy loam, 2 to 5 percent slopes	6-8	2/ 1,000-1,500	23-35	3-4	500-800
Ramona coarse sandy loam, 5 to 9 percent slopes	6-8	2/ 1,000-1,500	15-23	2-3	250-500
Ramona coarse sandy loam, 9 to 15 percent slopes	4-6	2/ 800-1,000	10-15	2-3	-----------
Ramona gravelly sandy loam, 2 to 9 percent slopes	4-6	2/ 800-1,000	15-23	2-3	250-500
Ramona loam, 2 to 5 percent slopes	6-8	2/ 1,000-1,500	23-35	3-4	500-800
Ramona loam, 5 to 9 percent slopes	6-8	2/ 1,000-1,500	15-23	2-3	250-500
Rosamond loamy fine sand	8-10	-----------	23-35	3-4	800-1,200
Rosamond fine sandy loam	10-11	-----------	35-40	4-5	1,200-1,500
Rosamond loam	10-11	-----------	35-40	4-5	1,200-1,500
Rosamond loam, sandy loam substratum	10-11	-----------	35-40	4-5	1,200-1,500
Rosamond silty clay loam	10-11	-----------	35-40	4-5	500-800
Sorrento loam, 0 to 2 percent slopes	10-11	1,000-1,500	35-40	4-5	1,200-1,500
Sorrento loam, 2 to 5 percent slopes	10-11	1,000-1,500	35-40	4-5	800-1,200
Sunrise loamy fine sand	4/ 4-6	-----------	4/ 15-23	4/ 1-2	4/ 500-800
Sunrise sandy loam	4/ 6-8	-----------	4/ 23-35	4/ 2-3	4/ 800-1,200
Sunrise sandy loam, shallow	4/ < 4	-----------	4/ 10-15	4/ 1-2	4/ < 250
Sunrise loam	4/ 6-8	-----------	4/ 23-35	4/ 3-4	4/ 800-1,200
Tray sandy loam	6-8	-----------	23-35	3-4	800-1,200

See footnotes at end of table.

Irrigated crops--Continued						Dryland crops	
Pasture	Peaches	Pears	Potatoes	Sugar beets	Wheat	Barley (grain)	Wheat
Animal-unit-months 1/	Tons	Tons	100-pound sacks	Tons	100-pound sacks	100-pound sacks	100-pound sacks
12-18	2/ 12-14	2/ 25-30	400-450	20-30	25-33	---	----
12-18	2/ 12-14	2/ 25-30	300-400	15-20	25-33	---	----
18-20	2/ 12-14	2/ 25-30	400-450	20-30	25-33	---	----
18-20	-----	-----	400-450	20-30	33-35	---	----
-----	-----	-----	-------	-----	-----	8-12	5-8
4/ 12-18	-----	-----	4/ 200-300	4/ 10-15	4/ 15-25	---	----
8-12	-----	-----	200-300	-----	15-25	---	----
8-12	-----	-----	200-300	-----	15-25	---	----
12-18	-----	-----	300-400	-----	25-33	---	----
12-18	-----	-----	300-400	-----	25-33	---	----
18-20	-----	-----	400-450	20-30	33-35	---	----
18-20	-----	-----	400-450	30-35	33-35	---	----
18-20	-----	-----	300-400	20-30	33-35	---	----
8-12	-----	-----	< 150	10-15	15-25	---	----
-----	-----	-----	-------	-----	-----	18-20	11-15
-----	-----	-----	-------	-----	-----	18-20	11-15
-----	-----	-----	-------	-----	-----	18-20	11-15
-----	-----	-----	-------	-----	-----	8-12	5-8
-----	-----	-----	-------	-----	-----	18-20	11-15
-----	-----	-----	-------	-----	-----	18-20	11-15
12-18	-----	-----	200-300	-----	25-33	---	----
8-12	-----	-----	-------	-----	15-25	---	----
-----	-----	-----	-------	-----	-----	8-12	5-8
12-18	2/ 8-12	2/ 15-25	200-300	15-20	25-33	12-18	8-11
12-18	2/ 8-12	2/ 15-25	200-300	10-15	25-33	12-18	8-11
12-18	2/ 8-12	2/ 15-25	150-200	-----	15-25	8-12	5-8
12-18	2/ 8-10	2/ 15-20	-------	-----	15-25	8-12	5-8
12-18	2/ 8-12	2/ 15-25	200-300	-----	15-25	3-8	2-5
12-18	2/ 8-12	2/ 15-25	200-300	15-20	25-33	8-12	5-8
12-18	2/ 8-12	2/ 15-25	150-200	-----	15-25	8-12	5-8
12-18	-----	-----	300-400	15-20	25-33	---	----
18-20	-----	-----	400-450	30-35	25-33	---	----
18-20	-----	-----	400-450	30-35	33-35	---	----
18-20	-----	-----	400-450	30-35	33-35	---	----
18-20	-----	-----	200-300	30-35	33-35	---	----
18-20	-----	-----	400-450	20-30	33-35	---	----
18-20	-----	-----	300-400	20-30	33-35	---	----
4/ 12-18	-----	-----	4/200-300	4/ < 10	4/ 15-25	---	----
4/ 12-18	-----	-----	4/300-400	4/ 15-20	4/ 15-25	---	----
4/ 8-12	-----	-----	-------	-----	4/ < 10	---	----
4/ 12-18	-----	-----	4/300-400	4/ 15-20	4/ 25-33	---	----
12-18	-----	-----	300-400	20-30	25-33	---	----

TABLE 2.--ESTIMATED AVERAGE ACRE YIELDS OF THE

Soil	Irrigated crops				
	Alfalfa (hay)	Almonds	Barley (grain)	Oat hay	Onions (dry)
	Tons	Pounds	100-pound sacks	Tons	50-pound sacks
Vernalis sandy loam, 0 to 2 percent slopes----------------------------------	10-11	---------	35-40	4-5	1,200-1,500
Vernalis loam, 0 to 2 percent slopes------	10-11	---------	35-40	4-5	1,200-1,500
Vernalis loam, 2 to 5 percent slopes------	10-11	---------	35-40	4-5	800-1,200
Vernalis clay loam, 0 to 2 percent slopes-	10-11	---------	35-40	4-5	500-800
Wyman gravelly loam, 2 to 9 percent slopes----------------------------------	6-8	2/ 800-1,000	23-35	2-3	250-500
Wyman gravelly loam, 9 to 15 percent slopes----------------------------------	6-8	2/ 800-1,000	15-23	2-3	250-500
Wyman cobbly loam, 5 to 9 percent slopes--	4-6	2/ 800-1,000	10-15	2-3	------------
Yolo loam, 0 to 2 percent slopes----------	10-11	1,500-1,700	35-40	4-5	1,200-1,500
Yolo loam, 2 to 9 percent slopes----------	8-10	1,500-1,700	35-40	4-5	1,000-1,200
Zamora loam, 2 to 9 percent slopes--------	8-10	1,500-1,700	35-40	4-5	1,000-1,200
Zamora loam, 9 to 15 percent slopes-------	8-10	1,000-1,500	23-35	3-4	500-800
Zamora clay loam, 2 to 9 percent slopes---	8-10	800-1,000	35-40	4-5	500-800

1/ The amount of forage or feed required to maintain one animal unit, or 1,000 pounds of live weight, for a period of 30 days. The ratings for irrigated pasture are based on (1) an 8-month grazing season; (2) applying nitrogen and phosphorus during the year, according to recommended local practice; (3) rotating grazing and withholding grazing when the soil is wet; (4) mowing when necessary to kill weeds and prevent bunching of grass; and (5) use of dragging to scatter manure.

Irrigated crops--Continued						Dryland crops	
Pasture	Peaches	Pears	Potatoes	Sugar beets	Wheat	Barley (grain)	Wheat
Animal-unit-months 1/	tons	Tons	100-pound sack	Tons	100-pound sacks	100-pound sacks	100-pound sacks
18-20	-----	-----	400-450	30-35	33-35	18-20	11-15
18-20	-----	-----	400-450	30-35	33-35	18-20	11-15
18-20	-----	-----	300-400	20-30	33-35	18-20	11-15
18-20	-----	-----	200-300	30-35	33-35	18-20	11-15
8-12	2/ 8-12	2/ 15-25	< 150	------	15-25	12-18	8-11
8-12	2/ 8-12	2/ 15-25	-------	------	15-25	12-18	8-11
8-12	2/ 8-12	2/ 10-15	-------	--------	10-15	5-8	2-5
18-20	-----	-----	400-450	30-35	33-35	-----	-----
18-20	-----	-----	300-400	25-30	33-35	-----	-----
18-20	-----	-----	300-400	25-30	33-35	12-18	8-11
12-18	-----	-----	150	-----	25-33	-----	-----
18-20	-----	-----	150-200	25-30	33-35	-----	-----

2/ Protection from frost may be needed.

3/ Drainage and leaching needed.

4/ A hardpan in the soil may need shattering.

order and are rated according to the Storie index (15) in table 3. This index expresses numerically the relative degree of suitability, or value, of a soil for general intensive agriculture. The rating is based on soil characteristics only. It does not take into account other factors, such as availability of water for irrigation, climate, and distance from markets, which might determine the desirability of growing specific crops in a given locality. For these reasons, the index, in itself, cannot be considered an index for land valuation.

Four factors that represent the inherent characteristics and qualities of the soil are considered in the index rating. Each factor is rated or evaluated separately in terms of percentage of the ideal, or 100 percent. The factors are:

Factor A, Profile characteristics. Factor A expresses relative suitability of a profile for the growth of plant roots. Soils that have deep permeable profiles are rated 100 percent. Those that have a dense clay layer or a hardpan or are shallow over bedrock are rated less than 100 percent. The rating depends upon the extent to which root penetration is limited.

Factor B, Texture of the surface soil. Factor B is rated according to the texture of the surface soil, which affects the ease of tillage and the capacity of the soil to hold water. The moderately coarse and medium textures--fine sandy loam, loam, and silt loam--are the most desirable and are rated as 100 percent. The coarser and finer textures, such as sand and clay, are rated less than 100 percent.

Factor C, Slopes. Factor C is particularly important if the soil is irrigated. The amount of water that runs off a soil and its susceptibility to erosion are influenced by the slope of the soil. Smooth, nearly level or very gently sloping soils are rated 100 percent. The rating decreases as the slope increases.

Factor X, Other conditions. Factor X is used to evaluate any limitations to use of the soil, such as poor drainage or a high water table, erosion, salts or alkali, low fertility, acidity, or unfavorable microrelief. If more than one limitation exists, the values of each are multiplied together to get the X factor.

The index rating of a soil is obtained by multiplying the four factors A, B, C, and X; thus, any one factor may dominate or control the final rating. For example, a soil may have an excellent profile justifying a rating of 100 percent for factor A, excellent texture of the surface soil justifying 100 percent for factor B, a smooth, nearly level surface justifying 100 percent for factor C, but a high accumulation of salts or alkali that would give a rating of 20 percent for factor X. Multiplying these four ratings gives an index rating of 20 for this soil. The high accumulation of salts or alkali dominates, makes the soil unproductive for crops, and justifies the low index rating of 20.

Soils are placed in grades according to their suitability for agricultural use as shown by their Storie index ratings. The six grades and their range in index ratings are--

	Index rating
Grade 1	80 to 100
Grade 2	60 to 80
Grade 3	40 to 60
Grade 4	20 to 40
Grade 5	10 to 20
Grade 6	Less than 10

Soils of grade 1 have few or no limitations that restrict their use for crops. Soils of grade 2 are suitable for most crops, but they have minor limitations that narrow the choice of crops and have few special management needs. Grade 3 soils are suited to a few crops or to special crops and require special management. Grade 4 soils are severely limited for crops. If used for crops, they require careful management. Grade 5 soils are not suited to cultivated crops but can be used for pasture and range. Grade 6 consists of soils and land types that generally are not suited to farming.

Vegetative Soil Groups

A vegetative soil group is a grouping of soils that have similar properties and qualities from the standpoint of plant adaptation and use. The grouping is used chiefly for determining the plants most suitable for conservation practices and production of forage when the major limiting soil feature or problem is known. The possibility of irrigation and such climatic factors as precipitation, maximum and minimum temperatures, and length of growing season are separate factors and are not covered here. The system is statewide, and six of the vegetative soil groups are recognized in the Antelope Valley Area. The soils in each vegetative group can be determined by referring to table 1, p.66 , or to the "Guide to Mapping Units" at the back of this survey. The groups are defined in the paragraphs that follow.

Group A--Choice of plants not limited by the soil. Soils are more than 36 inches deep. The surface layer ranges from sandy loam to silty clay loam. Permeability of the subsoil is moderately rapid to moderately slow, drainage is moderately good to good, and available water holding capacity is more than 5 inches for the entire profile.

Group B--Choice of plants limited by droughtiness and low fertility: Soils are more than 36 inches deep. The surface layer is sand, loamy sand, or gravelly sandy loam. Permeability of the subsoil is very rapid to moderately slow. Drainage is somewhat excessive to moderately good. Available water holding capacity is less than 5 inches for the entire profile or less than 2.5 inches for the upper 2 feet of soil if the surface layer is sand or loamy sand.

TABLE 3.--STORIE INDEX RATING FOR SOILS OF THE ANTELOPE VALLEY AREA

Soil	Storie index						
	Rating factors				Index rating	Soil grade	Limitation in factor X
	A (Profile)	B (Texture)	C (Slope)	X (Other conditions)			
Adelanto loamy sand, 2 to 5 percent slopes	90	80	95	90	62	2	Erosion.
Adelanto coarse sandy loam, 0 to 2 percent slopes	90	85	100	95	73	2	Erosion.
Adelanto gravelly sandy loam, 2 to 5 percent slopes	90	65	95	90	50	3	Erosion.
Agua Dulce stony loam, 30 to 50 percent slopes	70	70	40	70	14	5	Erosion.
Amargosa rocky coarse sandy loam, 9 to 55 percent slopes, eroded	50	80	65	65	17	5	Erosion.
Anaverde loam, 15 to 30 percent slopes	75	100	75	75	42	3	Erosion.
Anaverde rocky loam, 30 to 50 percent slopes	75	70	40	70	15	5	Erosion.
Arizo gravelly loamy sand, 0 to 5 percent slopes	90	35	95	100	30	4	
Arizo loamy fine sand, 0 to 2 percent slopes	90	90	100	72	58	3	Erosion.
Ayar clay loam, 5 to 15 percent slopes	85	85	85	90	55	3	Erosion.
Cajon loamy sand, 0 to 2 percent slopes	95	80	100	100	76	2	
Cajon loamy sand, 2 to 9 percent slopes	95	80	90	90	62	2	Erosion.
Cajon loamy sand, loamy substratum, 0 to 2 percent slopes	95	80	100	100	76	2	
Cajon loamy fine sand, 0 to 2 percent slopes, hummocky	95	85	80	76	49	3	Erosion; hummocky micro-relief.
Cajon loamy fine sand, 9 to 15 percent slopes, hummocky	95	85	85	72	49	3	Erosion; hummocky micro-relief.
Calvista-Hi Vista complex, 2 to 9 percent slopes	50	70	90	90	28	4	Erosion.
Calvista-Hi Vista rocky complex, 9 to 30 percent slopes	50	60	80	85	23	4	Erosion.
Castaic silty clay loam, 2 to 9 percent slopes	70	90	90	90	51	3	Erosion.
Castaic silty clay loam, 9 to 15 percent slopes	70	90	85	85	46	3	Erosion.
Castaic-Balcom silty clay loams, 9 to 15 percent slopes	70	90	85	85	46	3	Erosion.
Castaic-Balcom silty clay loams, 15 to 30 percent slopes	70	90	75	80	38	4	Erosion.
Castaic-Balcom silty clay loams, 30 to 50 percent slopes	70	90	40	70	18	5	Erosion.
Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded	70	90	40	65	16	5	Erosion.
Castaic-Balcom silty clay loams, 50 to 65 percent slopes, eroded	70	90	30	55	10	5	Erosion.
Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded	70	90	30	60	11	5	Erosion.
Chino loam	90	100	100	80	72	2	Drainage.
Cortina sandy loam, 0 to 2 percent slopes	90	95	100	100	86	1	
Cortina sandy loam, 2 to 9 percent slopes	90	95	90	90	69	2	Erosion.
Cortina cobbly sandy loams, 2 to 9 percent slopes	90	60	90	90	44	3	Erosion.
Dune land	--	--	--	--	<10	6	

TABLE 3.--STORIE INDEX RATING FOR SOILS OF THE ANTELOPE VALLEY AREA--Continued

Soil	Storie index						
	Rating factors				Index rating	Soil grade	Limitation in factor X
	A (Profile)	B (Texture)	C (Slope)	X (Other conditions)			
Gaviota rocky sandy loam, 15 to 30 percent slopes, eroded	40	65	75	80	16	5	Erosion.
Gaviota rocky sandy loam, 30 to 50 percent slopes, eroded	40	65	40	70	7	6	Erosion.
Gazos clay loam, 30 to 50 percent slopes	50	85	40	70	12	5	Erosion.
Godde loam, 15 to 30 percent slopes	40	100	75	80	24	4	Erosion.
Godde rocky loam, 30 to 50 percent slopes	40	70	40	70	8	6	Erosion.
Gorman sandy loam, 9 to 15 percent slopes	75	95	85	85	51	3	Erosion.
Gorman sandy loam, 9 to 15 percent slopes, eroded	75	95	85	80	48	3	Erosion.
Gorman sandy loam, 15 to 30 percent slopes, eroded	75	95	75	75	40	3	Erosion.
Gorman sandy loam, 30 to 50 percent slopes, eroded	75	95	40	65	19	5	Erosion.
Greenfield sandy loam, 0 to 2 percent slopes	100	95	100	100	95	1	
Greenfield sandy loam, 2 to 9 percent slopes	100	95	90	95	81	1	Erosion.
Greenfield sandy loam, 2 to 9 percent slopes, eroded	100	95	90	85	73	2	Erosion.
Greenfield sandy loam, 9 to 15 percent slopes, eroded	100	95	85	80	65	2	Erosion.
Gullied land	--	--	--	--	<15	5	
Hanford loamy sand, 2 to 5 percent slopes, hummocky	100	80	76	76	46	3	Erosion; hummocky micro-relief.
Hanford coarse sandy loam, 0 to 2 percent slopes	100	85	100	95	81	1	Fertility.
Hanford coarse sandy loam, 2 to 9 percent slopes	100	85	90	90	69	2	Erosion; fertility.
Hanford coarse sandy loam, 9 to 15 percent slopes	100	85	85	86	62	2	Erosion; fertility.
Hanford sandy loam, 0 to 2 percent slopes	100	95	100	100	95	1	
Hanford sandy loam, 2 to 9 percent slopes	100	95	90	95	81	1	Erosion.
Hanford gravelly sandy loam, 2 to 9 percent slopes	100	60	90	95	51	3	Erosion.
Hanford sandy loam, calcareous variant, 2 to 9 percent slopes	100	95	90	95	81	1	Erosion.
Hanford loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Hesperia loamy fine sand, 0 to 2 percent slopes	100	90	100	100	90	1	
Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky	100	90	100	80	72	2	Erosion; hummocky micro-relief.
Hesperia loamy fine sand, 2 to 5 percent slopes	100	90	95	95	81	1	Erosion.
Hesperia fine sandy loam, 0 to 2 percent slopes	100	100	100	100	100	1	

TABLE 3.--STORIE INDEX RATING FOR SOILS OF THE ANTELOPE VALLEY AREA--Continued

Soil	Storie index: Rating factors: A (Profile)	B (Texture)	C (Slope)	X (Other conditions)	Index rating	Soil grade	Limitation in factor X
Hesperia fine sandy loam, 2 to 5 percent slopes	100	100	95	95	90	1	Erosion.
Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes	100	100	100	100	100	1	
Hesperia loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Las Posas loam, 9 to 30 percent slopes	60	100	80	80	38	4	Erosion.
Las Posas-Toomes rocky loams, 30 to 50 percent slopes	55	70	40	70	11	5	Erosion.
Lebec rocky loam, 15 to 50 percent slopes	70	100	60	75	32	4	Erosion.
Merrill sandy loam	65	95	100	81	50	3	Saline spots; fertility.
Metz loamy sand, 0 to 2 percent slopes	100	80	100	100	80	1	
Metz loamy sand, 2 to 9 percent slopes	100	80	90	95	68	2	Erosion.
Metz loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Metz loam, 2 to 5 percent slopes	100	100	95	95	90	1	Erosion.
Millsholm rocky loam, 15 to 30 percent slopes, eroded	40	70	75	75	16	5	Erosion.
Millsholm rocky loam, 30 to 50 percent slopes, eroded	40	70	40	65	7	6	Erosion.
Mocho sandy loam, 0 to 2 percent slopes	100	95	100	100	95	1	
Mocho loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Mocho loam, 2 to 9 percent slopes	100	100	90	95	86	1	Erosion.
Mohave coarse sandy loam, 2 to 5 percent slopes	70	85	95	90	51	3	Erosion.
Oakdale sandy loam, 2 to 9 percent slopes	100	95	100	100	95	1	
Oak Glen sandy loam, 0 to 2 percent slopes	100	95	100	100	95	1	
Oak Glen sandy loam, 2 to 9 percent slopes	100	95	90	95	81	1	Erosion.
Oak Glen gravelly sandy loam, 2 to 9 percent slopes	100	60	90	95	51	3	Erosion.
Oak Glen loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Oak Glen loam, 2 to 9 percent slopes	100	100	90	95	86	1	Erosion.
Ojai loam, 2 to 9 percent slopes	70	100	90	90	57	3	Erosion.
Ojai loam, 9 to 15 percent slopes	70	100	85	85	51	3	Erosion.
Ojai loam, 15 to 30 percent slopes	70	100	75	80	42	3	Erosion.
Ojai loam, 30 to 50 percent slopes	70	100	40	70	20	4	Erosion.
Ojai loam, 30 to 50 percent slopes, eroded	70	100	40	65	18	5	Erosion.
Ojai loam, thin surface variant, 30 to 50 percent slopes	65	100	40	70	18	5	Erosion.
Ojai-Zamora loams, 15 to 30 percent slopes	80	100	75	85	64	2	Erosion.
Pond loam	70	100	100	50	35	4	Salt affected.
Pond silty clay loam	70	90	100	50	32	4	Salt affected.
Pond-Oban complex	70	90	100	50	32	4	Salt affected.
Ramona coarse sandy loam, 0 to 2 percent slopes	80	85	100	100	68	2	
Ramona coarse sandy loam, 2 to 5 percent slopes	80	85	95	95	61	2	Erosion.
Ramona coarse sandy loam, 5 to 9 percent slopes	80	85	90	90	55	3	Erosion.

TABLE 3.--STORIE INDEX RATING FOR SOILS OF THE ANTELOPE VALLEY AREA--Continued

Soil	Storie index						
	Rating factors				Index rating	Soil grade	Limitation in factor X
	A (Profile)	B (Texture)	C (Slope)	X (Other conditions)			
Ramona coarse sandy loam, 9 to 15 percent slopes	80	85	85	85	49	3	Erosion.
Ramona sandy loam, 9 to 30 percent slopes, eroded	80	90	80	75	42	3	Erosion.
Ramona gravelly sandy loam, 2 to 9 percent slopes	80	60	90	86	37	4	Erosion; fertility.
Ramona gravelly sandy loam, 9 to 30 percent slopes	80	60	80	76	29	4	Erosion; fertility.
Ramona loam, 2 to 5 percent slopes	80	100	95	95	72	2	Erosion.
Ramona loam, 5 to 9 percent slopes	80	100	90	90	65	2	Erosion.
Riverwash	--	--	--	--	<5	6	
Rock land	--	--	--	--	<5	6	
Rosamond loamy fine sand	90	90	100	100	81	1	
Rosamond loamy fine sand, hummocky	90	90	100	80	65	2	Hummocky microrelief.
Rosamond fine sandy loam	90	100	100	100	90	1	
Rosamond loam	90	100	100	100	90	1	
Rosamond loam, saline-alkali	90	100	100	80	72	2	Salt affected.
Rosamond loam, sandy loam substratum	85	100	100	100	85	1	
Rosamond silty clay loam	90	90	100	100	81	1	
Rosamond silty clay loam, saline-alkali	90	90	100	70	57	3	Salt affected.
Rough broken land	--	--	--	--	<5	6	
Sandy alluvial land	--	--	--	--	<10	6	
Saugus loam, 15 to 30 percent slopes	75	100	75	80	45	3	Erosion.
Saugus loam, 30 to 50 percent slopes	75	100	40	70	21	4	Erosion.
Saugus loam, 30 to 50 percent slopes, eroded	75	100	40	65	19	5	Erosion.
Sheridan sandy loam, 15 to 30 percent slopes	75	95	75	80	43	3	Erosion.
Sheridan sandy loam, 15 to 30 percent slopes, eroded	75	95	75	75	40	3	Erosion.
Sheridan sandy loam, 30 to 50 percent slopes	75	95	40	70	20	4	Erosion.
Sheridan sandy loam, 30 to 50 percent slopes, eroded	75	95	40	65	19	5	Erosion; fertility.
Soboba cobbly loamy sand, 2 to 5 percent slopes	75	30	95	86	18	5	Erosion; fertility.
Sorrento loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Sorrento loam, 2 to 5 percent slopes	100	100	95	95	90	1	Erosion.
Sunrise loamy fine sand	50	90	100	90	41	3	Erosion.
Sunrise sandy loam	50	95	100	90	43	3	Erosion.
Sunrise sandy loam, shallow	30	95	100	90	26	4	Erosion.
Sunrise loam	50	100	100	100	50	3	
Sunrise loam, saline-alkali	50	100	100	80	40	3	Salt affected.

TABLE 3.--STORIE INDEX RATING FOR SOILS OF THE ANTELOPE VALLEY AREA--Continued

Soil	Storie index						
	Rating factors				Index rating	Soil grade	Limitation in factor X
	A (Profile)	B (Texture)	C (Slope)	X (Other condi-tions)			
Temescal-Rock land complex, 30 to 50 percent slopes	--	--	--	--	<10	6	
Terrace escarpments	--	--	--	--	< 5	6	
Tray fine sand, hummocky	95	65	100	61	38	4	Erosion; micro-relief; salt.
Tray sandy loam	95	95	100	95	86	1	Erosion; (salt reclaim-ed).
Tray sandy loam, saline-alkali	95	95	100	75	69	2	Erosion; salt affected.
Tray loam, saline-alkali	95	100	100	80	76	2	Salt affected.
Vernalis sandy loam, 0 to 2 percent slopes	100	95	100	100	95	1	
Vernalis loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Vernalis loam, 2 to 5 percent slopes	100	100	95	95	90	1	Erosion.
Vernalis clay loam, 0 to 2 percent slopes	100	85	100	100	85	1	
Vista coarse sandy loam, 9 to 15 percent slopes, eroded	75	85	85	80	43	3	Erosion.
Vista coarse sandy loam, 15 to 30 percent slopes	75	85	75	80	38	4	Erosion.
Vista coarse sandy loam, 15 to 30 percent slopes, eroded	75	85	75	75	36	4	Erosion.
Vista coarse sandy loam, 30 to 50 percent slopes	75	85	40	70	18	5	Erosion.
Vista coarse sandy loam, 30 to 50 percent slopes, eroded	75	85	40	65	17	5	Erosion.
Wyman gravelly loam, 2 to 9 percent slopes	90	75	90	95	58	3	Erosion.
Wyman gravelly loam, 9 to 15 percent slopes	90	75	95	85	55	3	Erosion.
Wyman cobbly loam, 5 to 9 percent slopes	90	50	90	90	36	4	Erosion.
Yolo loam, 0 to 2 percent slopes	100	100	100	100	100	1	
Yolo loam, 2 to 9 percent slopes	100	100	90	95	86	1	Erosion.
Zamora loam, 2 to 9 percent slopes	100	100	90	95	86	1	Erosion.
Zamora loam, 9 to 15 percent slopes	100	100	85	90	77	2	Erosion.
Zamora clay loam, 2 to 9 percent slopes	100	85	90	95	73	2	Erosion.

Group E--Choice of plants limited by wetness: Soils are more than 60 inches deep. The surface layer is loam. Permeability of the subsoil is moderately slow, drainage is somewhat poor, and salinity is none to slight.

Group F--Choice of plants limited by salinity or alkalinity: Soils are more than 20 inches deep. The surface layer is fine sandy loam to silty clay loam. Permeability is moderately rapid to slow, drainage is moderately good, salinity or alkalinity is moderate to strong.

Group G--Choice of plants limited by depth: Soils are 10 to more than 36 inches deep to a hardpan or to unfractured rock. The surface layer is sand to silty clay loam. Permeability of the subsoil is moderately rapid to moderately slow, drainage is moderately good to somewhat excessive, and available water holding capacity is more than 3 inches.

Group J--Choice of plants depends upon onsite investigation: Most of the soils or land types are in capability classes VII or VIII and are too steep for normal planting methods or too shallow for most plants.

Use of the Soils for Range[3]

Approximately 68 percent of the Antelope Valley Area is used as range. About half of the range is in the desert and is used only for occasional grazing in spring. The principal kind of livestock is beef cattle, though many sheep also graze the areas.

In the central and western part of the survey area, the principal range soils are in the Agua Dulce, Balcom, Castaic, Gaviota, Gorman, Hanford, Las Posas, Millsholm, Oak Glen, Ojai, Ramona, Saugus, and Vista series. At high altitudes in Kern County, soils of the Anaverde, Lebec, and Sheridan series are used largely as range. In the eastern part of the survey area, the principal range soils are in the Adelanto, Cajon, Hesperia, Mohave, Oban, Pond, Rosamond, Sunrise, and Tray series.

The forage in the western part of the Area consists mostly of annual grasses, though it includes needlegrass and other perennial grasses in varying proportions. At low elevations open grassland or chaparral make up the range, but at medium elevations the vegetation is pines or pines and grasses interspersed with areas of open grassland.

From the western part of the survey area toward the desert is semidesert grassland. The forage here includes such annual grasses as red brome, cheatgrass, soft chess, and wild barley. Desert stipa, a perennial grass, also grows here. Desert bluegrass occupies the shallow rocky slopes, but as the elevations increase it gives way to chaparral. California juniper is common.

In the eastern part of the survey area, the vegetation consists of such desert shrubs as creosotebush, Joshua-trees, desert stipa, and other plants that resist drought.

Range Sites

The soils used for grazing in the Antelope Valley Area have been grouped into range sites. Each site differs from other range sites in its ability to produce significantly different kinds and amounts of range plants and in the management needed to keep the site in good condition. The grouping is based partly on the kind of soils and partly on the climate. Variations in climate are marked in the Area and affect the kind of plants that grow in a particular place and their rate of growth. Native plants in the desert, for example, differ greatly from those growing in the central and western parts of the survey area where rainfall is greater and the rate of evapotranspiration is lower.

Various kinds of desirable and undesirable plants make up the forage. Most of the desirable range plants in the survey area were introduced. The native plants were a mixture of perennials and annuals. The introduced plants are mostly annuals that grow in cool weather when the supply of moisture is most plentiful. These plants furnish highly nutritious feed in the spring when they are green and growing, but their nutritional value is low after they mature.

Livestock graze selectively, and they seek out the palatable and nutritious plants. If grazing is not carefully regulated, the better, more desirable plants are weakened or eliminated. Less desirable plants then increase. If grazing pressure continues, even the less desirable plants are thinned out or eliminated and undesirable weeds take their place, or the soil is left bare. The rancher who wants to plan a grazing program that improves or maintains the range needs to know the carrying capacity of the range. Annual productivity varies, however, depending on annual rainfall and condition of the range because of past management. Stocking rates therefore can be determined only after an investigation of the site. Assistance in determining initial stocking rates can be obtained from local representatives of the Soil Conservation Service and from farm advisers of the University of California.

The soils of the survey area that are used for range have been grouped into nine range sites to help the rancher in managing rangeland. These sites have been placed in two zones according to the amount of rainfall. Sites 1 through 5 are in the 9- to 20-inch precipitation zone, and sites 6 through 9 are in the 4- to 9-inch precipitation zone. Annual air-dry production is estimated for each site. The estimates are based on total production of all kinds of plants on the range. The range sites are described in the pages that follow.

[3] By Irvin L. Sealander, range conservationist, Soil Conservation Service.

The mention of the soil series in these descriptions does not mean that all the soils in a series are in the range site. The soils in each site can be determined by referring to table 1, p. 66, or to the "Guide to Mapping Units" at the back of this survey.

1. Clayey Site, 9- to 20-Inch Precipitation Zone

This site is in the southwestern part of the survey area near Castaic. It consists of clay loams and silty clay loams in the Ayar, Balcom, Castaic, Gazos, Vernalis, and Zamora series. These soils are moderately deep to very deep, well drained, and nearly level to steep. Most of the soils are at elevations of 1,200 to 3,100 feet. The Ayar soil, however, occurs at an elevation of about 3,300 feet. This site occupies about 31,000 acres.

Permeability of these soils is moderately slow to slow. The water-holding capacity is high, and fertility is low to moderate. Runoff is very slow to very rapid, and some of the steep soils are eroded.

The soils in this site produce heavy stands of wild oats and burclover and smaller amounts of soft chess, ryegrass, and filaree. In places needlegrass and other perennial grasses are predominant. Under heavy grazing all of these desirable grasses are replaced by less desirable grasses, such as ripgut brome, or by red brome, poverty fescue, weedy annuals, and other undesirable grasses. In some years tarweed is a problem on depleted range, but wild mustard is likely to infest even well-managed range.

Where the established grasses have been burned off by repeated wildfire, chamise and other brushy plants now grow. Except for mapping unit CmG2, all of the soils of this site are well suited for seeding of adapted annual grasses and legumes.

On this site total annual production of air-dry herbage ranges from 2,400 pounds per acre in years of favorable moisture to 1,000 pounds per acre in years of unfavorable moisture.

2. Loamy Site, 9- to 20-Inch Precipitation Zone

This site occurs chiefly in the western and southern parts of the survey area. It consists of soils of the Agua Dulce, Anaverde, Gorman, Greenfield, Hanford, Las Posas, Lebec, Oakdale, Oak Glen, Ojai, Ramona, Saugus, Sheridan, Toomes, Vernalis, Vista, Wyman, Yolo, and Zamora series. The surface layer of these soils ranges from loam to coarse sandy loam. Some areas are gravelly or stony, and in places rocks crop out. Soils in this unit are shallow to very deep, well drained or somewhat excessively drained, and nearly level to steep. Some areas are rolling or hilly. Elevations generally range from 860 to 4,500 feet but are as much as 6,500 feet in a few places. This site occupies about 318,000 acres.

Permeability of these soils is moderately rapid to moderately slow. Available water holding capacity ranges from low to very high, and fertility is low to high. Runoff is very slow to rapid, and some of the soils are eroded.

The western part of this site has a cover of open grass, of grass and brush, or of trees and grass. As the elevation and rainfall increase, the number of oaks increases. Where elevation is highest and rainfall is most abundant, the areas include open grass, dense stands of oak, and some Digger pines and Jeffrey pines. In many places at this high elevation, steep north slopes have a dense cover of Brewer scrub oak and a sparse understory of grassy plants. Where the site merges into semidesert, the cover generally is open grass that in some places has a few to many shrubs, such as Ceanothus and California juniper.

When this site is producing at its potential, such desirable plants as wild oats, soft chess, ryegrass, cutleaf filaree, and annual clover are dominant. In places needlegrass, deergrass, blue wildrye, and other perennial grasses are present, and they predominate in some places. At the high elevations pine bluegrass grows in places, and desert needlegrass may be present in stands in the more arid areas. No more than 30 percent of the cover consists of less desirable and undesirable plants, such as ripgut brome, red brome, wild barley, poverty fescue, shrubs, and forbs.

Under heavy grazing less desirable and undesirable annual grasses and forbs and flattop buckwheat increase. On areas damaged by fire, ceanothus, scrub oak, chamise, and flattop buckwheat increase and may predominate. Many of the soils are well suited for seeding of annual grasses and legumes where the slope is not too steep for farm machinery. Also, areas near the desert may not receive enough rainfall for successful seeding. Mapping units not suited to AgF, ApF, GoF2, LdF, OgF, OgF2, OhF, ScF, ScF2, ShF, ShF2, VsF, and VsF2. The production of forage can be improved by removing the trees and brush that grow in some places.

On this site total annual production of air-dry herbage ranges from 1,800 pounds per acre in years of favorable moisture to 200 pounds in years of unfavorable moisture.

3. Sandy Site, 9- to 20-Inch Precipitation Zone

Areas of this site occur mainly on alluvial fans along the foothills of the San Gabriel Mountains, near Valermo and near Saugus and Newhall. This site occupies the more arid part of the precipitation zone. It consists of soils in the Cortina, Hanford, and Soboba series and of Sandy alluvial land. These soils have a surface layer of sandy loam, loamy sand, or cobbly loamy sand. Small areas are hummocky. The soils of this site are very deep and are well drained to excessively drained. They are mostly gently sloping but range from nearly level to moderately sloping. Elevations range from 1,200 to 3,700 feet. This site occupies about 6,000 acres.

Permeability of these soils is moderately rapid to very rapid. Available water holding capacity is low to moderate, and fertility is low to very low. Runoff is very slow to medium.

Predominant on this site are such desirable annuals as soft chess, wild oats, and cutleaf filaree.

The overstory is thin to moderately dense and consists of goldenbush, California sagebrush, flattop buckwheat, mule fat, and other shrubs. It also includes a few cottonwoods and other trees. Needlegrass, junegrass, and other perennial grasses grow in some places.

Where the range has been depleted through heavy grazing or for any other reason, desirable grasses decrease and are replaced by red brome, nitgrass, forbs, and other less desirable and undesirable plants. Goldenbush, flattop buckwheat, and other brushy plants also increase. Production of forage can be improved by removing the trees and brush that grow in some places. Seeding of grasses and legumes is successful only on the Hanford soil and on the Cortina sandy loams.

Total annual production of air-dry herbage on this site ranges from 1,500 pounds per acre in years of favorable moisture to 300 pounds in years of unfavorable moisture.

4. Shallow Loamy Site, 9- to 20-Inch Precipitation Zone

This site is mostly in the northwestern, southwestern, and southern parts of the survey area. It consists of soils in the Amargosa, Gaviota, Godde, Millsholm, and Temescal series. The surface layer is sandy loam or loam. Most of the soils are rocky or rocks crop out in large areas. Many of the soils are eroded. The soils are shallow, are well drained to excessively drained, and are strongly sloping to steep. Elevations range from 2,000 to 5,000 feet. This site occupies about 41,000 acres.

Permeability of these soils is moderate to moderately rapid. Available water holding capacity and fertility are low to very low. Runoff is medium to very rapid.

The plant cover on this site is open grass or brush. In a few places the brush is dense and consists of flattop buckwheat or chamise. On the higher mountains are dense stands of Brewer scrub oak that have few to no herbaceous plants in the understory.

Where the range is producing at its potential, such brushy plants as ceanothus, scrub oak, chamise, flattop buckwheat, and sumac make up 50 percent of the plant cover. About 30 percent of the plant cover is wild oats, soft chess, filaree, and other desirable plants. Needlegrass, pine bluegrass, squirreltail, and other perennial grasses may predominate at higher elevations. The remaining 20 percent is ripgut brome, red brome, cheatgrass, annual fescue, forbs, and other less desirable and undesirable plants.

Desirable plants decrease and undesirable brushy plants increase on range that has been depleted because of heavy grazing or fire. Areas burned repeatedly have almost pure stands of chamise on them. Except for Godde loam, 15 to 30 percent slopes, practices for improving range are not suited to these soils. Seeding of grass should be done only to protect the watershed after a fire. Brush should be removed only for control of fire.

Total annual production of air-dry herbage on this site ranges from 500 pounds per acre in years of favorable moisture to 50 pounds in years of unfavorable moisture. Yields are lower on the more arid hills close to the desert than in other parts of the site.

5. Wet Meadow Site, 9- to 20-Inch Precipitation Zone

Chino loam is the only soil in this site. It occupies fairly narrow, nearly level areas mainly in Leona Valley, in Potrero Canyon, and near Agua Dulce. This soil is very deep, has a seasonal high water table, and is somewhat poorly drained. The content of salts and alkali is slight to moderate, and the soil is strongly calcareous. This site occupies about 2,100 acres.

Permeability of this soil is moderately slow. Runoff is very slow, and in places water stands in ponds on the areas. Potential productivity is high.

Where the range is producing at its potential, the plant cover is 50 percent creeping wildrye, pine bluegrass, and other perennials and 50 percent sedges and wire rush. Native clover also grows in places. Under heavy grazing the perennial grasses decrease, sedges and wire rush increase, and eventually wire rush predominates. Annual grasses and forbs, particularly cutleaf filaree, increase on range damaged by excessive grazing and by rodents. Thistles and other undesirable weeds also are likely to infest such areas. If the water table is lowered by drought or erosion or by pumping from wells, the original plant cover is replaced by plants similar to those on site 2. Then big sagebrush also is common.

This site is suited to seeding of perennial grasses. Care is needed, however, in preparing the seedbed because of severe competition from wire rush. The water table can be kept high if practices are used that control erosion and that keep gullies from cutting into the range.

Total annual production of air-dry herbage on this site ranges from 4,000 pounds per acre in years of favorable moisture to 1,200 pounds in years of unfavorable moisture.

6. Alkali Flats Site, 4- to 9-Inch Precipitation Zone

This site is in the desert on the edge of basins or in valley troughs. It extends from Lancaster north and east to Rosamond Lake and to Rogers Lake. It consists of soils in the Merrill, Oban, Pond, Rosamond, Sunrise, and Tray series. The surface layer ranges from fine sand to silty clay loam in texture. A few areas are hummocky. The soils are nearly level and are moderately well drained. Most of the soils are very deep, but some are moderately deep, and others are shallow. Elevations range from about 2,300 to 2,450 feet. This site occupies about 68,000 acres.

Permeability of these soils is moderate to slow. Available water holding capacity is moderate to very high, and fertility is low to very low. Runoff is

very slow. Some areas receive runoff from higher areas. The soils are slightly to severely affected by salts and alkali.

On this site dense stands of four-wing saltbush and other kinds of saltbush provide the main cover, but big sagebrush and rabbitbrush grow in some areas. Saltgrass and alkali sacaton grow in places and are dominant in a few areas. In years when rainfall is above average, red brome, cheatgrass, cutleaf filaree, and other annuals are abundant. Many areas of this site are adjacent to and merge into basin areas and are severely affected by salts and alkali. Here alkali blite, iodine bush, and other plants that tolerate salts grow. Because of limitations of climate, it is not feasible to improve the range by applying practices for control of weeds and brush.

Total annual production of air-dry herbage on this site ranges from 600 pounds per acre in years of favorable moisture to 200 pounds per acre in years of unfavorable moisture.

7. Loamy Site, 4- to 9-Inch Precipitation Zone

This site is in the central and eastern parts of the survey area. The areas are adjacent to and intermingled with areas of irrigated cropland. This site consists of soils in the Adelanto, Hesperia, Mohave, and Rosamond series. These soils have a surface layer of coarse sandy loam, fine sandy loam, or loam. They are very deep, are well drained or moderately well drained, and are nearly level to gently sloping. Elevations range from about 2,400 to 2,900 feet. This site occupies about 44,500 acres.

Permeability of these soils is moderately rapid to moderately slow. Available water holding capacity is high to very high, and fertility is low to moderate. Runoff is slow to very slow.

Creosotebush and bursage are predominant on this site, but saltbush, rabbitbrush, big sagebrush, and other desert shrubs grow in places. As much as 15 percent of the plant cover is desert stipa and other bunch grasses. Where the average annual rainfall is more than 6 inches, Joshua-trees grow in scattered to open stands. At higher elevations the stands include California juniper. Cheatgrass, red brome, filaree, and other annual grasses and forbs also grow on this site. They are likely to make enough growth in years when rainfall is above average to provide additional grazing in spring.

Under heavy grazing desert stipa decreases and in some places is nearly eliminated. Creosotebush and bursage increase. In recent years desert stipa has increased, however, in much of the area. The increase is because no grazing has been done or grazing has been only by sheep in spring.

Total annual production of air-dry herbage on this site ranges from 125 pounds per acre in years of favorable moisture to 25 pounds per acre in years of unfavorable moisture.

8. Sandy Site, 4- to 9-Inch Precipitation Zone

This site is in the central and southeastern parts of the survey area. It consists of soils in the Adelanto, Arizo, Cajon, Hesperia, and Rosamond series. These soils have a surface layer of loamy sand, loamy fine sand, or sandy loam. Some of the soils are gravelly, and others have hummocks on them that are as much as 3 feet high. The soils of this site are very deep, are excessively drained to moderately well drained, and are nearly level to strongly sloping. Elevations range from 2,400 to 2,900 feet. This site occupies about 161,500 acres.

Permeability of these soils is moderate to very rapid. Available water holding capacity is low to very high, and fertility is very low to moderate. Runoff is very slow to medium. The hazard of soil blowing is moderate to high.

The plant cover on this site is similar to that on site 7, but stands of shrubs are denser, Joshua-trees are more numerous, and Indian ricegrass is present. Potential productivity is greater because the supply of moisture is more favorable. In a few years rainfall is abundant. Then, growth of annual grasses and forbs is sufficient to provide additional grazing in spring. Because of limitations of climate, it is not feasible to improve the range by seeding grasses and removing brush.

Total annual production of air-dry herbage on this site ranges from 150 pounds per acre in years of favorable moisture to 50 pounds per acre in years of unfavorable moisture.

9. Shallow Loamy Site, 4- to 9-Inch Precipitation Zone

This site is in the northeastern part of the survey area near Hi Vista. It consists of soils in the Calvista and Hi Vista series. The surface layer ranges from sandy loam to loamy fine sand. Soils of this site are shallow to moderately deep, are well drained, and are sloping to moderately steep. Granitic rock is at a depth of about 15 to 36 inches. Rock crops out in many places. Elevations range from 2,900 to 3,100 feet. This site occupies about 46,000 acres.

Permeability of these soils is moderately slow to moderately rapid. Available water holding capacity is very low to moderate, and fertility is very low to low. Runoff is slow to rapid.

Scattered stands of creosotebush and other desert shrubs and a scattering of such plants as desert stipa and indiangrass make up the plant cover on this site. Red brome and cheatgrass and many kinds of wildflowers are abundant in years when rainfall is favorable. These plants do not provide dependable forage. Improving the range through seeding grasses and removing brush is not feasible.

Total annual production of air-dry herbage on this site ranges from 50 pounds per acre in years of favorable moisture to no appreciable amount in years of unfavorable moisture.

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Use Of The Soils For Windbreaks

Soil blowing is a hazard in all parts of the Antelope Valley Area. It is most serious, however, near Fairmont and eastward to the San Bernardino County line. Rainfall varies markedly in the survey area, and some parts are nearly treeless. Windbreaks therefore are needed for protecting farmsteads and livestock.

Many trees that are planted in the survey area are planted for the purpose of establishing windbreaks. The expense and labor involved in planting are offset by the benefits to the rancher or farmer. Among the benefits are beautifying and protecting buildings, lots, and gardens; control of soil drifting; and preventing the accumulation of dunes and hummocks around fences, houses, and farm implements. Windbreaks also provide livestock shelter that helps to reduce feed costs and to improve habitats for songbirds and other wildlife.

Windbreak Groups

The soils of the Antelope Valley Area have been placed in five windbreak groups to help the rancher or farmer in establishing windbreak plantings. Each group is made up of soils that are suited to the same kinds of trees and that need similar management.

For each group suitable trees are listed. In making the groupings it is assumed that irrigation is needed for optimum growth of the trees listed and that the plantings will be suitably protected and properly cared for. It also is assumed that the plantings will be made at suitable intervals and that proper cultural practices are used so that the trees will provide needed soil protection. It is further assumed that all plantings will be made as nearly as feasible at right angles to the prevailing wind. Additional information about windbreaks can be obtained from the publication "Windbreaks in Conservation Farming" (20).

In the pages that follow the windbreak groups of the Antelope Valley Area are described. The mention of the soil series in these descriptions does not mean that all the soils in a series are in the windbreak group. The soils in each group can be determined by referring to table 1, p. 66 , and to the "Guide to Mapping Units" at the back of this survey.

Windbreak Group 1

In this group are deep or very deep, moderately well drained or well drained soils. These soils are in the Adelanto, Balcom, Castaic, Gorman, Greenfield, Hanford, Hesperia, Las Posas, Metz, Mocho, Mohave, Oakdale, Oak Glen, Ojai, Ramona, Rosamond, Saugus, Sorrento, Tray, Vernalis, Wyman, Yolo, and Zamora series. The surface layer ranges from coarse sandy loam to silty clay loam. Some of the soils are eroded, and others are gravelly. Slopes are 0 to 30 percent.

Permeability of these soils is moderately rapid to moderately slow. Reaction generally is slightly acid to moderately alkaline. Problems caused by salts and alkali are slight to none. Available water holding capacity is more than 5.0 inches. The hazard of erosion is slight to moderate.

Soils of this group are suitable for many kinds of trees, depending on the location. In the foothills and mountains Arizona cypress, Arizona ash, Coulter pine, and black locust grow well. Blue gum and Arizona cypress can be planted in the southwestern part of the Area. In other areas of these soils, suitable trees to plant are Arizona cypress, poplar, Russian-olive, Arizona ash, Siberian elm, black locust, honeylocust, and Aleppo pine. Arundo donax, or reedgrass, also can be planted.

Windbreak Group 2

This group consists of very deep soils that are excessively drained to moderately well drained. It consists of soils in the Adelanto, Cajon, Cortina, Hanford, Hesperia, Metz, Oak Glen, Ramona, Rosamond, and Tray series. The surface layer is loamy sand to sandy loam. Some of the soils are gravelly, and others are hummocky. Slopes are 0 to 15 percent.

These soils are droughty. Most of the soils are slightly acid to moderately alkaline. Tray fine sandy, hummocky, however, is more alkaline in the lower layers than the other soils. Available water holding capacity is less than 5 inches. The hazard of soil blowing is slight to high.

Suitable trees for soils in this group are athel and Arizona cypress. On the Cortina and Metz soils, however, red gum can be planted in place of athel.

Windbreak Group 3

The soils in this group are very deep, are moderately well drained to somewhat poorly drained, and contain salts and alkali. They are in the Chino, Oban, Pond, Rosamond, Sunrise, and Tray serie The surface layer is loam, silty clay loam, or sandy loam. All of the soils are nearly level, and except for the Chino soil, are in the Mojave Desert. The Chino soil is in narrow valleys.

Permeability of the soils in this group ranges from moderate to moderately slow. The content of salts and alkali varies from place to place, but it ranges from moderate to high. Available water holding capacity is more than 5.0 inches. The hazard of soil blowing is slight to moderate.

The only tree suitable for planting on these saline-alkaline soils is athel. This tree tolerates salts and alkali and gives good protection. It generally grows well on these soils, though in colder winters it is likely to die back.

Windbreak Group 4

In this group are shallow to moderately deep, moderately well drained,nearly level soils. These soils are in the Merrill and Sunrise series. The surface layer is sandy loam, loamy fine sand, or loam. A hardpan that is cemented with lime is at a depth of about 15 to 30 inches.

Because of pumping of ground water, drainage of these soils has been altered. The soils generally are moderately alkaline in the surface layer and in the upper part of the substratum but may be more alkaline below.

Suitable trees for the soils in this group are athel and Arizona cypress. In many places the hardpan limits penetration of roots and water. Breaking or shattering the hardpan, or removing the hardpan by digging, allows roots to penetrate to a greater depth.

Windbreak Group 5

This group consists of shallow to very deep soils that vary widely in characteristics. It consists of soils in the Agua Dulce, Amargosa, Anaverde, Arizo, Ayar, Balcom, Calvista, Castaic, Cortina, Gaviota, Gazos, Godde, Hi Vista, Lebec, Millsholm, Ojai, Ramona, Saugus, Sheridan, Soboba, Temescal, Toomes, Vista, and Wyman series. The land types Dune land, Gullied land, Riverwash, Rock land, Rough broken land, Sandy alluvial land, and Terrace escarpments also are in this group. The surface layer ranges from coarse sandy loam to silty clay loam. Some areas are gravelly or cobbly, and others are rocky. Many of the soils are eroded. Slopes are 0 to 65 percent.

The soils in this group are poorly suited to windbreak plantings. Onsite investigation of a specific area is needed before plantings are made.

Use of the Soils for Wildlife

Game and fish are important in the Antelope Valley Area primarily for the recreational opportunities they provide for hunting and fishing. Many species of wildlife, however, are also beneficial in control of undesirable rodents and insects. Others eat weed seeds that hinder growth of farm crops.

Quail and mourning doves are common in the survey area. The habitat is not favorable for pheasants, however, and pheasants are available only in shooting preserves. Only a few chukars live in the survey area, though the habitat in many parts is favorable for this bird. Ducks are common, and a few flocks of migratory geese stop in the area to rest and feed. In some years flocks of band-tailed pigeons migrate through the northwestern part of the Area.

Deer is the chief big game animal. A few black bears and mountain lions are found along the headwaters of Cottonwood Creek. Smaller mammals in the Area include jack rabbits, cottontail rabbits, ground squirrels, coyotes, and bobcats. In addition many other small animals and other nongame species occur throughout the survey area, as well as many kinds of songbirds and other birds. Various kinds of waterfowl and fish frequent the streams of the area. In addition bluegill, catfish, black bass, and trout have been planted in local ponds and reservoirs.

The kinds of wildlife that live in a particular area depend upon the kinds of habitat available. Under natural conditions certain kinds of vegetation grow in various combinations in an area, depending on the kinds of soils. Wildlife generally is more abundant and the rate of production is higher on the more fertile soils than on soils of poor quality.

Suitability of the soils for various kinds of wildlife varies according to the depth of the soil, its slope and texture, the stones or rocks present, the drainage, and the available water holding capacity. Location and position on the landscape also are important.

The soils of the survey area have been placed in six wildlife groups according to the suitability of the soils for growth of plants important in developing habitat for wildlife. Considered in making these groupings were three main kinds of wildlife for which habitat could be developed and managed. These were upland game, waterfowl, and big game. Suitability for commercial fish ponds or for recreational use also was considered. Only the kinds of wildlife that provide hunting or fishing were considered.

Suitability of the wildlife groups for various kinds of plants is shown in table 4. Also shown in table 4 is suitability of the various plants listed for use by stated kinds of wildlife. The wildlife groups are discussed in the pages that follow. The soils in each group can be determined by referring to table 1, p. 66 , or to the "Guide to Mapping Units" at the back of this survey.

Wildlife Group 1

This group consists chiefly of moderately well drained to somewhat excessively drained, nearly level to steep soils. These soils are on alluvial fans or are on foothills. Water is available for irrigation in many places, but may be lacking in the foothills.

The surface layer of the soils in this group ranges from coarse sandy loam to silty clay loam. Depth of the soils is more than 20 inches. Permeability ranges from moderately rapid to moderately slow. Available water holding capacity is more than 5.0 inches. Reaction is slightly acid to moderately alkaline.

All soils in this group are well suited to plants (table 4) that provide food and cover for such upland game as quail, pheasants, chukars, doves, and rabbits. Suitability of the soils for ponding of water for waterfowl or fish is moderately good to poor, depending on how permeable the soil is. Few deer live in areas of this wildlife group. Furthermore, developing habitat for deer may not be compatible with farming uses of the soils.

Wildlife Group 2

Soils in this group are very deep, are excessively drained to moderately well drained, and are droughty. They are on alluvial fans, and most of the soils are nearly level to moderately sloping.

TABLE 4.--SUITABILITY OF SPECIFIED PLANTS IN THE ANTELOPE VALLEY AREA FOR WILDLIFE GROUPS OF SOILS AND FOR SPECIFIED KINDS OF WILDLIFE

[An Arabic number 1 means the plant named is suited to the wildlife group or has high value for the kind of wildlife; 2 means suitability of the plant is fair to marginal for the wildlife group or kind of wildlife; dashes in the columns mean the plant is not suited to soils of the wildlife group or its suitability is not known, or that the plant seldom is used by the particular kind of wildlife or its use is not known]

Plant	Wildlife group and rating						Kind of wildlife and rating							
	1	2	3	4	5	6	Chukar	Deer	Dove	Ducks	Pheasant	California quail	Mountain quail	Rabbits
Alfalfa	1/ 1	1/ 2	-	-	1/ 1	-	1	1	-	-	1	2	-	1
Alkali bulrush	2	-	1	-	-	-	-	-	-	1	2	-	-	-
Arizona cypress	1	1	-	2	1	-	-	2	2	-	2	1	1	2
Athel	1	1	1	2	-	2	-	-	1	-	2	2	-	2
Barley	1/ 1	1/ 1	2	2	2	-	2	1	2	1	1	1	1	1
Birchleaf mountain-mahogany	2	2	--	2	1	-	-	1	-	-	-	2	2	1
Bitterbrush (desert)	2	2	-	2	1	-	2	1	-	-	-	1	1	1
Black sage	1	1	-	2	2	2	1	2	-	-	-	2	2	1
Bladderpod	1	1	-	2	2	2	1	2	-	-	-	1	1	1
Burclover	1	2	2	2	1	2	1	1	-	-	2	1	1	1
Ceanothus	1	2	-	2	1	2	2	1	-	-	-	2	1	1
Chamise	1	1	-	1	1	2	2	2	-	-	-	2	2	1
Desert saltbush (A. polycarpa)	1	1	1	2	-	2	2	2	2	-	2	1	1	1
Doveweed (turkey-mullein)	1	1	2	1	1	2	1	-	1	-	2	1	1	-
Ephedra	1	1	2	1	2	2	1	1	-	-	-	1	1	2
Filaree	1	1	2	1	1	2	1	1	2	-	2	1	1	1
Four wing-saltbush	1	1	1	2	2	2	2	1	-	-	2	1	1	1
Hardinggrass	1	-	-	-	1	-	2	2	2	-	2	1	1	1
Hollyleaf cherry	1	2	-	2	1	-	-	1	-	-	2	1	1	2
Indian ricegrass	2	1	-	2	-	-	1	2	1	-	-	1	1	1
Japanese millet (watergrass)	1	2	1	-	-	-	-	-	1	1	1	2	-	2
Lupine (annual)	1	2	-	1	1	2	1	2	2	-	-	1	1	-
Lana vetch	1	2	-	2	1	-	-	1	1	-	2	1	1	1

TABLE 4.--SUITABILITY OF SPECIFIED PLANTS IN THE ANTELOPE VALLEY AREA FOR WILDLIFE GROUPS OF SOILS AND FOR SPECIFIED KINDS OF WILDLIFE--Continued

Plant	Wildlife group and rating						Kind of wildlife and rating							
	1	2	3	4	5	6	Chukar	Deer	Dove	Ducks	Pheasant	California quail	Mountain quail	Rabbits
Milo	1/ 1	1/ 2	2	-	-	-	1	2	1	2	1	1	-	-
Multiflora rose	1	2	2	-	2	-	-	2	-	-	2	1	-	1
Oaks	1	1	-	2	1	-	-	1	1	-	-	1	1	2
Pampasgrass	1	2	2	2	1	-	-	-	2	-	2	2	-	1
Ponderosa pine	1	2	-	2	1	-	1	2	-	-	-	2	1	-
Pyracantha	1	2	-	-	1	-	-	2	-	-	2	1	1	1
Smartweed	1	-	2	-	-	-	-	-	2	1	2	2	-	-
Soft chess	1	1	2	1	1	2	1	1	-	-	2	1	1	1
Sudangrass	1	2	2	-	-	-	-	1	2	2	1	2	-	1
Toyon	1	2	-	-	1	-	-	2	-	-	-	1	1	2
Wheat	1/ 1	1/ 2	-	-	2	-	1	1	1	1	1	1	1	2
White sage	1	2	-	2	1	2	2	2	-	-	-	2	2	2
Wild buckwheat	1	1	-	1	1	2	1	2	-	-	-	1	1	2

1/ It is assumed that water is available for supplemental irrigation.

A few of the soils, however, have slopes as steep as 15 to 30 percent. Some areas are hummocky. Water is available for irrigation in most areas.

In most of the soils, the surface layer ranges from fine sand to gravelly sandy loam. One soil is cobbly loam throughout. Permeability ranges from rapid to moderately slow. Available water holding capacity is less than 5.0 inches in many of the soils, but it is more than 5.0 inches in some soils that have a coarse-textured surface layer.

The soils in this group are moderately well suited to plants (table 4) that provide food and cover for such upland game as chukars, quail, pheasants, doves, and rabbits. The soils are not suitable for ponding of water for waterfowl or fish, or they are only poorly suited. Developing the areas as habitat for deer is not feasible, because cultivated crops are grown in much of the area.

Wildlife Group 3

In this group are moderately deep to very deep, somewhat poorly drained to moderately well drained soils that are affected by salts and alkali. These soils are nearly level and are on the lower part of alluvial fans, on the basin rim, or in valleys. Most areas are not irrigated, and irrigation water needs to be developed.

The surface layer of the soils in this group ranges from sandy loam to silty clay loam. Permeability ranges from slow to moderate. Available water holding capacity ranges from about 5.0 to nearly 12.0 inches. The content of salts and alkali varies from place to place, but it is moderate to high in most places.

Soils in this group are moderately well suited to poorly suited to plants (table 4) that provide food and cover for quail, pheasant, chukar, doves, and rabbits. Their suitability for providing habitat for deer is poor. Suitability of the soils for ponding of water for waterfowl and warm water fish is good to moderately good. Economic returns are likely to be good.

Wildlife Group 4

This group consists of shallow soils that are well drained to excessively drained. These soils are strongly sloping to steep, and many of them are eroded. They are on foothills, and many of the areas are hilly. Water generally is not available for irrigation.

The surface layer of the soils in this group ranges from coarse sandy loam to clay loam. Depth of most of the soils is less than 20 inches. Rock crops out in many places. Permeability ranges from moderately rapid to moderately slow. Available water holding capacity is less than 5.0 inches.

Soils in this group are moderately well suited to plants (table 4) that provide food and cover for chukars, pheasants, quail, doves, and rabbits. They provide excellent habitat for chukars and quail if drinking water is available. The soils are not suitable for waterfowl habitat, and they are poorly suited to ponding of water in small ponds for fish and other recreation.

Wildlife Group 5

In this group are moderately deep to very deep, well-drained soils. These soils are nearly level to steep, and many of them are eroded. They occupy high elevations that have about 16 to 20 inches of rainfall each year. Irrigation water generally is not available.

The surface layer of the soils in this group ranges from sandy loam to loam. Rock crops out in a few areas. Permeability ranges from moderately rapid to moderately slow. Available water holding capacity is more than 3.0 inches.

Soils in this group are well suited to plants (table 4) that provide food and cover for deer, quail, doves, and rabbits. Suitable habitat can be developed for pheasants on the more nearly level soils where irrigation water may be more readily available. In some areas it may be necessary to provide drinking water for birds during dry periods. Because of the slopes, these soils generally are not suitable for large impoundments of water for waterfowl. The more nearly level soils, however, are suitable for developing small ponds for fish and other wildlife.

Wildlife Group 6

In this group are shallow to moderately deep soils that are steep to very steep. Rock crops out in places, and some of the soils are severely eroded. Also in this group are land types made up of dunes or escarpments, of riverwash, or of rocky areas or gullied areas. Water is not available for irrigation.

Areas of this group are poorly suited for development of habitat for any kind of wildlife. The soils are fairly well suited to a few plants (table 4) that could provide food and cover for wildlife. Some of the plants provide food and cover for quail in upland areas. Others provide suitable habitat for rabbits along stream channels or among the dunes.

Use of the Soils for Recreation and Related Purposes

In this subsection the limitations of the soils in the survey area for specified recreational and related uses are discussed.

Each nonfarm use is defined in the paragraphs that follow, and the properties important in rating the limitation of the soils for such purposes are given. The ratings used are slight, moderate, and severe. They are shown for each soil for each nonfarm use in table 1, p. 66.

Play areas.--Soils are rated according to their limitations for play areas in table 1. A play area is used for playgrounds and for baseball, football,

badminton, volley ball, and other organized games. Such an area requires good drainage and a nearly level, firm surface. It needs to be essentially free of rock outcrops, stones, and other coarse fragments. Irrigation water needs to be available if the area is one that ordinarily requires a turf.

The ratings for play areas are based on soil properties. They do not take into account other factors, such as location, that are important in selecting a site. Following are explanations of the ratings.

A soil has slight limitations for play areas if it has all of the following features. Slopes are less than 2 percent; the surface layer is sandy loam, fine sandy loam, very fine sandy loam, or loam; the content of gravel is less than 1 percent and there are no cobblestones, other stones, or rocks; depth to hard bedrock, a hardpan, or the seasonal water table is more than 40 inches; drainage is somewhat excessive, good, or moderately good; and permeability is rapid, moderately rapid, or moderate.

A soil that has moderate limitations for play areas has one or more of the following features. Slopes are 2 to 5 percent; the surface layer is loamy sand, silt loam, clay loam, sandy clay loam, or silty clay loam; the content of gravel is less than 5 percent, and less than 3 percent of the surface area is covered by cobblestones, other stones, and rocks; depth to hard bedrock, a hardpan, or the water table is 20 to 40 inches; drainage is excessive or somewhat poor; and permeability is very rapid or is moderately slow.

A soil has severe limitations for this use if one or more of the following apply. Slopes are more than 5 percent; the surface layer is sand, sandy clay, silty clay, or clay; the content of gravel is more than 5 percent and cobblestones, other stones, and rocks cover more than 3 percent of the surface area; depth to hard rock, a hardpan, or the seasonal water table is less than 20 inches; drainage is poor or very poor; and permeability is slow or very slow.

Picnic areas.--Soils are rated according to their limitations for picnic areas in table 1. A picnic area is used for pleasure outings at which a meal is eaten outdoors. The chief requirements for such areas is good trafficability, and it is assumed that little site preparation is needed.

The ratings for picnic areas are based on soil properties. They do not take into account other factors, such as location, that are important in selecting a site. Not considered in the ratings was the need for removal of stones or grading and shaping, or the problems of water supply and sewage. Suitability of the soils for supporting vegetation is a separate item and should be considered in making the final evaluation when selecting a site for a picnic area. Following are explanations of the ratings.

A soil has slight limitations for picnic areas if it has all of the following features. Slopes are less than 5 percent; the surface layer is sandy loam, fine sandy loam, very fine sandy loam, or loam and may be gravelly; cobblestones, other stones, and rocks occupy less than 3 percent of the surface area; drainage is somewhat excessive, good, or moderately good; depth to the seasonal water table is more than 40 inches; there are no damaging floods.

A soil that has moderate limitations for this use has one or more of the following features. Slopes are 5 to 15 percent; the surface layer is loamy sand, silt loam, sandy clay loam, clay loam, silty clay loam, gravelly loamy sand, or gravelly silty clay loam or the soil is gravelly; cobblestones, other stones, and rocks occupy 3 to 15 percent of the surface area; drainage is excessive or somewhat poor; depth to the seasonal water table is 20 to 40 inches; flooding occurs 1 to 2 years in 10 but does not damage the areas, though water may be ponded in some places.

A soil has severe limitations for picnic areas if one or more of the following apply. Slopes are more than 15 percent; the surface layer is sand, sandy clay, silty clay, clay, gravelly sand, gravelly silty clay, or the soil is very gravelly; cobblestones, other stones, and rocks occupy more than 15 percent of the surface area; drainage is poor or very poor; depth to the seasonal water table is less than 20 inches; flooding and ponding occur more often than 2 years in 10.

Lawns and golf fairways.--Soils are rated in table 1 according to their limitations for lawns and golf fairways. These areas refer to tracts around residences, factories, apartment houses, and school buildings and in intensively used parks that are used for lawns and golf fairways. Such areas need to be free of rock outcrops and other coarse fragments.

The ratings for lawns and golf fairways are based on soil properties. They do not take into account other factors, such as location, that are important in selecting a site. They do not refer to golf greens and sandtraps, because most of these are manmade. The need for leveling or for topsoil, or the kind of grass on the areas, was not considered in the ratings. Following are explanations of the ratings.

A soil has slight limitations for lawns and golf fairways if all of the following features apply. Slopes are less than 2 percent; the surface layer is sandy loam, fine sandy loam, very fine sandy loam, loam, and silt loam; there are no cobblestones, other stones, or rocks; depth to hard bedrock, a hardpan, or the seasonal water table is more than 40 inches; drainage is moderately good to good; permeability of the subsoil is moderate or moderately rapid; available water holding capacity is more than 5 inches; electrical conductivity at 25° C., in millimhos per centimeter, is less than 4; percentage of exchangeable sodium is less than 15 for the upper 20 inches of soil.

A soil that has moderate limitations for this use has one or more of the following features. Slopes are 2 to 15 percent; the surface layer is loamy sand, sandy clay loam, silty clay loam, or clay loam or the soil is gravelly; cobblestones, other stones, and rocks occupy less than 3 percent of the surface area; depth to hard bedrock, a hardpan, or the seasonal water table is between 20 and 40 inches; drainage is somewhat excessive or somewhat poor;

permeability of the subsoil is rapid or moderately slow; available water holding capacity is 3.75 to 5.0 inches; electrical conductivity at 25° C., in millimhos per centimeter, is between 4 and 8; percentage of exchangeable sodium is less than 15 for the upper 20 inches of soil.

A soil that has severe limitations for lawns and golf fairways has one or more of the following features. Slopes are more than 15 percent; the surface layer is sand, gravelly sand, gravelly loamy sand, and gravelly clay or the soil is very gravelly; cobblestones, other stones, and rocks cover more than 3 percent of the surface area; depth to hard bedrock, a hardpan, or the seasonal water table is less than 20 inches; drainage is excessive, poor, or very poor; permeability of the subsoil is very rapid, slow, or very slow; available water holding capacity is less than 3.75 inches; electrical conductivity at 25° C., in millimhos per centimeter, is more than 8; percentage of exchangeable sodium is more than 15 inches for the upper 20 inches of soil.

Campsites.--Soils are rated according to their limitations for campsites in table 1. A campsite is an area that is used intensively for tents and small camp trailers and for outdoor dining. Campsites require little site preparation other than minor shaping and leveling of areas used for tents and parking. The soils must be able to support heavy traffic by people, horses, and vehicles. Areas that have outcrops of rock on them are considered to be very severely limited for this use.

The ratings for campsites are based on soil properties. They do not take into account other factors, such as location, that are important in selecting a site. Not considered in the ratings were the problems of water supply, sewage disposal, or access roads. Suitability of the soils for supporting vegetation is a separate item and should be considered in making the final evaluation when selecting an area for a campsite. Following are explanations of the ratings.

A soil has slight limitations for campsites if all of the following features apply. Slopes are less than 5 percent; the surface layer is sandy loam, fine sandy loam, or loam; cobblestones, other stones, and rocks cover less than 3 percent of the surface area; drainage is somewhat excessive, good, or moderately good; permeability is rapid, moderately rapid, or moderate; depth to the seasonal water table is more than 40 inches; there is no flooding.

A soil that has moderate limitations for this use has one or more of the following features. Slopes are 5 to 9 percent; the surface layer is very fine sandy loam, loamy sand, silt loam, sandy clay loam, silty clay loam, or clay loam or the soil is gravelly; cobblestones, other stones, and rocks cover 3 to 10 percent of the surface area; drainage is somewhat poor or excessive; permeability is moderately slow or very rapid; depth to the seasonal water table is 20 to 40 inches; flooding occurs less than 1 year in 10.

A soil has severe limitations for campsites, however, if one or more of the following features apply. Slopes are more than 9 percent; the surface layer is sand, sandy clay, silty clay, clay, gravelly silty clay or gravelly clay or the soil is very gravelly; cobblestones, other stones, and rocks cover more than 10 percent of the surface area; drainage is poor or very poor; permeability is slow or very slow depth to the seasonal water table is less than 20 inches; flooding occurs more often than 1 year in 10.

Paths and trails.--Soils are rated according to their limitations for paths and trails in table 1. Paths and trails are areas that are used for cross-country hiking, bridle paths, and other nonintensive purposes that provide for random movement of people. The chief requirement for such areas is good trafficability. The areas are assumed to be for use as they occur in nature and need little soil excavation.

The ratings for paths and trails are based on soil properties. They do not take into account other features, such as esthetic value, that would make the soil desirable but would require more preparation or maintenance. An example is a mountain lookout where a guardrail would be needed. Following are explanations of the ratings.

A soil has slight limitations for paths and trails if all of the following features apply. Slopes are 0 to 15 percent; the surface layer is not sand, gravelly sand, or very gravelly and does not consist of organic material; cobblestones, other stones, and rocks occupy less than 3 percent of the surface area; drainage is somewhat excessive good, or moderately good; depth to the seasonal water table is more than 40 inches; there is no flooding and ponding.

A soil that has moderate limitations for this use has one or more of the following features. Slopes are 15 to 30 percent; the surface layer is not sand gravelly sand, or very gravelly and does not consist of organic material; cobblestones, other stones, and rocks occupy no more than 3 to 15 percent of the surface area; drainage is somewhat poor; depth to the seasonal water table is between 20 and 40 inches the chance of flooding and ponding is less than 2 years in 10.

A soil has severe limitations for paths and trails if one or more of the following apply. Slope are more than 30 percent; the soils are sand, gravelly sand, or very gravelly or consist of organic material; cobblestones, other stones, and rocks cover more than 15 percent of the surface area; drainage is poor or very poor; depth to the seasonal water table is less than 20 inches; the chance of flooding and ponding is more than 2 years in 10.

Septic tank filter fields.--Soils are rated according to their limitations for septic tank filter fields in table 1. The term septic tank filter field refers to a sewage system in which waste is distributed to a central tank and the effluent from the tank is dispersed over a fairly large area of filter field lines buried in the soil. It is assumed that the minimum depth of soil over the tile lines is 12 inches and that the diameter of the

lines is 4 inches. It also is assumed that the minimum depth of filter material over the lines is 2 inches and that that under the lines is 12 inches.

The ratings in table 1 were based on soil properties. Coarse-textured soil materials, for example, may permit contamination of water supplies. Percolation rates may be used as part of the criteria, but they are not listed because actual records were not compiled. Following are explanations of the ratings.

A soil has slight limitations for filter fields if all of the following features apply. Permeability is more than 1.0 inch per hour; depth to the seasonal water table is more than 4 feet; drainage is excessive, somewhat excessive, or good; depth to impervious bedrock, a hardpan, or the permanent water table is more than 6 feet; slopes are less than 5 percent; and flooding is not a hazard.

A soil that has a moderate limitation for septic tank filter fields has one or more of the following features. Permeability is between 1.0 to 0.63 inch per hour; depth to the seasonal water table is between 2 and 4 feet; drainage is moderately good or somewhat poor; depth to impervious bedrock, a hardpan, or the permanent water table is 4 to 6 feet; slopes range from 5 to 9 percent; the chance of flooding is 1 year in 10, and length of flooding is less than 48 hours.

A soil has severe limitations for this use, however, if one or more of the following apply. Permeability is less than 0.63 inch per hour; depth to the seasonal water table is less than 2 feet; drainage is poor or very poor; depth to impervious bedrock, a hardpan, or to the permanent water table is less than 4 feet; slopes are more than 9 percent; the chance of flooding is 1 year in 5, and the flood lasts more than 48 hours.

Sewage lagoons.--Soils are rated according to their limitations for sewage lagoons in table 1. A sewage lagoon consists of an impoundment area and an embankment. Ponds, lagoons, or lakes built to store water for other reasons have similar limitations. In making the ratings, the subsoil was the major horizon considered. The ratings assume that the soil is compacted or otherwise manipulated to provide effective sealing, but that no sealant or lining material is applied. They also assume that 1 foot of the least pervious soil layer or other material within the construction site is placed on the floor of the lagoon. A sewage lagoon should be planned so that not less than 2 feet nor more than 5 feet of liquid is in the lagoon. The percentage of organic matter in the soil and the content of coarse fragments larger than 10 inches in diameter also were considered in the ratings. Two ratings are given in table 1--one for the impoundment area and the other for the embankment. Following are explanations of the ratings.

IMPOUNDMENT AREA. A soil has slight limitations for an impoundment area if all of the following apply. Permeability is less than 0.63 inch per hour; depth to hard rock is more than 5 feet; slopes are less than 2 percent; less than 20 percent, by volume, of the soil material is coarse fragments that range from 2 millimeters to 10 inches in diameter; texture is clay, silty clay, gravelly clay, silty clay loam, clay loam, sandy clay loam, silt loam, and loam of mixed or montmorillonitic mineralogy; the silt loam and loam are more than 18 percent clay; the Unified (22) classification is GC, SC, CL, or CH.

A soil that has moderate limitations for this use has one or more of the following features. Permeability is 0.63 to 2.0 inches per hour; depth to hard rock ranges from 3 to 5 feet; slopes are 2 to 9 percent; as much as 20 to 50 percent, by volume, of the soil material is coarse fragments that range from 2 millimeters to 10 inches in diameter; texture is clay, silty clay, silty clay loam, clay loam, sandy clay loam, silt loam, and loam of kaolinitic mineralogy and very fine sandy loam, fine sandy loam, and sandy loam of any mineralogy and all of these may be gravelly; the silt loam and loam are less than 18 percent clay and have any mineralogy; the Unified (22) classification is GM, ML or MH, or SM (20 to 50 percent fines).

A soil has severe limitations for an impoundment area if one or more of the following features apply. Permeability is more than 2.0 inches per hour; depth to hard rock is less than 3 feet; slopes are more than 9 percent; more than 50 percent, by volume, of the soil material is coarse fragments 2 millimeters to 10 inches in diameter; texture is sand, gravelly sand, or peat and muck; the Unified (22) classification is SM (less than 20 percent fines), GW, GP, SW, SP, OL, OH, and Pt.

EMBANKMENT. A soil has slight limitations for an embankment if the texture is gravelly clay, clay loam, or sandy clay loam and the Unified (22) classification is GC, SC, or SM (20 to 50 percent fines). A soil that has moderate limitations for this use has texture of clay, silty clay, silty clay loam, silt loam, very fine sandy loam, loam, or sandy loam; the Unified (22) classification is GM, CL, CH, ML, MH, or SM (less than 20 percent fines). On the other hand, a soil has severe limitations for an embankment if the soil is gravel or sand, is organic silt or clay that is 15 to 30 percent organic matter, or is peat and muck; the Unified (22) classification is GW, GP, SW, SP, OL, OH, or Pt.

Engineering Uses of the Soils

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, and pipelines, the foundations of buildings, facilities for storing water, structures for controlling erosion, drainage systems, and systems for disposing of sewage. The properties most important to the engineer are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size, plasticity, and reaction. Also important are depth to water table, flooding hazard, depth to bedrock or to sand and gravel, and relief. Such information is made available in this section. Engineers can use it to--

1. Make soil and land use studies that will aid in selecting and developing industries, businesses, residences, and recreational areas.
2. Assist in planning and designing erosion and flood control structures, drainage improvements, farm ponds, irrigation systems, diversion terraces, and other structures for conservation of soil and water.
3. Make preliminary evaluations of soil conditions that will aid in selecting locations for highways, airports, pipelines, and cables, and in planning more detailed surveys for the selected locations.
4. Locate probable sources of sand, gravel, and other materials suitable for construction needs.
5. Correlate performance of engineering structures with mapping units to develop information for general planning that will be useful in designing and maintaining certain engineering practices and structures.
6. Determine the suitability of soil types for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and aerial photographs.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

It should be emphasized that the interpretations made in this soil survey do not eliminate the need for sampling and testing needed at a site chosen for a specific engineering work that involves heavy loads or at a site where excavations are to be deeper than the depths of the layers here reported. Also, engineers should not apply specific values to the estimates for allowable soil pressure given in this survey. Nevertheless, by using this survey, an engineer can select and concentrate on those soil units most important for his proposed kind of construction, and in this manner, reduce the number of samples taken for laboratory testing and complete an adequate soil investigation at minimum cost.

The soil mapping units shown on the maps in this survey may include small areas of a different soil material. These included soils may be as much as 2 acres in size. They are too small to be mapped separately and generally are not significant to the agriculture in the area but may be important in engineering planning.

Information of value in planning engineering work is given throughout the text, particularly in the sections "Descriptions of the Soils" and "Formation, Morphology, and Classification of Soils."

Some of the terms used by the scientist may be unfamiliar to the engineer, and some words--for example, soil, clay, silt, and sand--may have a special meaning in soil science. These and other special terms used in the soil survey are defined in the Glossary at the back of this survey. Most of the information about engineering is given in tables 5, 6, and 7.

Engineering classification systems

Agricultural scientists of the U.S. Department of Agriculture classify soils according to texture (19). In some ways this system of naming textural classes is comparable to the system most commonly used by engineers for classifying soils; that is, the system of the American Association of State Highway Officials (AASHO) and the Unified system.

Most highway engineers classify soil materials in accordance with the system approved by the American Association of State Highway Officials (1). In this system soil materials are classified in seven principal groups. The groups range from A-1 (gravelly soils having high bearing capacity, the best soils for subgrade) to A-7 (clayey soils having low strength when wet, the poorest soils for subgrade). Within each group the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best materials to 20 for the poorest. The group index number for the soils tested is shown in parentheses after the soil group symbol in table 5.

Some engineers prefer to use the Unified Soil Classification System (22). In this system soil materials are identified as coarse grained, 8 classes; fine grained, 6 classes; and highly organic. Table 5 shows the classification of the tested soils according to the Unified system.

Engineering Test Data

Table 5 gives test data for samples of selected layers taken from the profiles of some extensive soils of the survey area. The samples were taken in representative sites and were tested in the laboratory of District VII, California State Division of Highways and in the Soil Survey Laboratory, Soil

Conservation Service, U.S. Department of Agriculture at Riverside, Calif. The data in the table show the mechanical analyses, liquid limit, plasticity index, moisture density, potential volume change, coefficient of linear extensibility, bulk density, and R value. Also shown is the classification of the samples under the American Association of State Highway Officials (AASHO) system and the Unified system.

Mechanical analysis was determined by the sieve and hydrometer method. The data shows the relative proportions of the different size particles in the soil material. The size and proportions of the particles affect the behavior of soil material when it is used for engineering purposes.

The tests for liquid limit and plastic limit measure the effect of water on consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which the soil material passes from a plastic to a liquid state. The plasticity index is the numerical difference between liquid limit and plastic limit. It indicates the range in moisture content within which a soil material is in a plastic condition.

The relation of moisture content and the density to which a soil material can be compacted are important for engineering purposes. If soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the density decreases with increase in moisture content. The moisture content at which the maximum dry density is obtained is the optimum moisture content.

Also shown in table 5 is the capacity of the soils to expand, as determined by two test procedures. The procedure to determine the coefficient of linear extensibility was carried out on undisturbed, unconfined (except by moisture tension) samples. It determines the vertical component of volume change upon drying from a moisture tension of 1/3 atmosphere to oven dryness. The procedure to determine potential volume change was carried out on disturbed samples that were compacted in a mold and allowed to expand in one dimension against a force as the moisture content was increased from air dryness to saturation. The data on the coefficient of linear extensibility is useful in working with soil in a natural condition, and that on potential volume change is helpful in working with compacted soil fills. Road construction, structure of foundations, and reservoir sites are all affected by high shrink-swell characteristics.

The "R," or resistance, value of the soils also is listed in table 5. This characteristic is useful in evaluating treated and untreated materials for base, subbase, and subgrade in designing pavement thickness. The "R" value determines the thickness of cover or structural section required to prevent plastic deformation of soil under imposed wheel loads.

Engineering properties

Table 6 lists the soil series in the survey area, the map symbols for each mapping unit, and gives estimates of soil properties significant to some engineering work. Gullied land, Riverwash, Rock land, Rough broken land, Sandy alluvial land, and Terrace escarpments, however, are not listed in the table. These land types are too variable in characteristics to be rated or otherwise are not suitable for engineering use. Also not listed in the table is depth to a seasonal high water table. Chino loam is the only soil affected, and in this soil depth to the seasonal water table is more than 36 inches.

Given in table 6 are the depth to bedrock and the estimated USDA, Unified, and AASHO classifications. In addition, estimates of the percentages of material passing through the various sieves are given. Also shown are estimates of the Atterberg values, permeability, available water capacity, reaction, salinity, shrink-swell potential, corrosivity of uncoated steel, sanitary absorption capacity, and allowable soil prèssure. The estimates are based partly on examinations made in the field and partly on results of test data shown in table 5. Since the estimates are only for typical soils, considerable variation from these values should be anticipated. More information on the range of properties of the soils can be obtained in other parts of this survey, particularly in the section "Descriptions of the Soils."

According to the system used by soil scientists of the U.S. Department of Agriculture, the basic textural class name is based on the size distribution of the material smaller than 2.0 millimeters in diameter. The material smaller than 2.0 millimeters in diameter is classified into three size fractions--sand, silt, or clay. The percentage of the three size fractions determines the textural classification. The prefix "gravelly" or "cobbly" is used if the soil is 15 to 35 percent gravel or cobblestones, by volume.

Soil permeability is the ability of a soil to transmit air or water. The rates shown in table 6 are for the soils as they occur in place. The estimates were made by comparison with soils of known permeability and are shown as the range in which the soil normally will fall. The rates are helpful in determining potential use. Rapid permeability, for example, indicates that seepage losses at reservoir sites in the soil will be large. Very slow permeability, on the other hand, suggests the soil is likely to have a perched water table during a long rainy season or after excessive irrigation.

The available water capacity, expressed in inches per inch of soil depth, is the capacity of a soil to retain water that can be readily absorbed by plants. It is the estimated amount of moisture held in soil between field capacity and the permanent wilting point of plants.

The column showing reaction gives the estimated

acidity or alkalinity of the soil expressed in pH value. A pH value of more than 7.3 indicates the soil is alkaline (basic), a pH value of less than 6.6 indicates an acid soil, and a pH value between 6.6 and 7.3 indicates a neutral soil.

Salinity of a soil is based on the electrical conductivity of saturated soil extract as expressed in millimhos per centimeter at 25° C. Salinity not only affects the suitability of a soil for production of crops, but it also affects the stability of a soil when used as construction material and its corrosiveness to other material.

The degree of limitations indicated for the soils in the columns in table 6 giving shrink-swell potential and corrosivity (untreated steel) are low, moderate, and high.

Shrink-swell potential refers to the change in volume of the soil material that results from a change in content of moisture. It is estimated on the basis of the kind and amount of clay in the soil layers. In general, soils that have a high content of clay have high shrink-swell potential, and coarser textured soils that contain less clay have a low shrink-swell potential. The soil that contains the most clay generally shrinks and swells the most, but in some areas the kind of clay in the soil may be more important than the amount.

Much damage to building foundations, roads, and other structures is caused by the shrinking and swelling of soils as they become dry or wet. Soils that have a low shrink-swell potential are suitable for building sites if other factors are favorable. As the shrink-swell potential increases, the soil becomes less suitable for buildings and roads. More detailed investigation of a site is needed where the soils have moderate or high shrink-swell potential. If large housing developments are placed on soils that have moderate or high shrink-swell potential, applying large amounts of water to lawns, shrubs, and other plants could cause ground water to accumulate in the subsurface and cause land slippage. Land slippage is particularly a hazard on the steeper slopes.

The ratings for corrosivity in table 6 are based strictly on soil characteristics. Most materials used in construction, such as metal and concrete, corrode or deteriorate when buried in soil. The rate at which a material deteriorates depends largel upon the physical, chemical, and biological characteristics of the soil, and a given material corrodes more rapidly in some soils than in others. The corrosion probability generally is greater for extensive installations that intersect soil boundaries or soil horizons than for installations in one kind of soil or soil horizon. The range of characteristics between the layers in the profile of some soils is wide. As a result, the depth that a pipe or othe structural material is buried can affect the degree of corrosion. A soil that has a more strongly developed subsoil, for example, has a different corrosivity rating for structural material laid near the surface than for such material laid just above or in the subsoil layer.

Construction of buildings and of pavements, fill and compaction operations, adding material to the surface soil, and other measures that alter soil per meability increase the probability of corrosion. Mechanical agitation or excavation that results in non uniform mixing of soil horizons is likely also to increase the probability of corrosion. In addition corrosivity, particularly for steel pipes or other structures, is likely to be increased by electrical leaks from underground cables and by electrical charges resulting from dissimilar metal composition. Other factors likely to increase corrosivity are the quality of water used for watering plants, differences in the water content along conduits or structures, and the adding of fertilizer and of large amounts of organic matter.

Several soil characteristics affect the rate of corrosion of untreated steel. The most important of these are (1) electrical resistance to flow of current, (2) total acidity, (3) soil drainage, and (4) soil texture.

The sanitary absorption capacity column in table 6 is based on five typical soil textural groups from table 11-4, p. 676, of the Los Angeles County Plumbing Code, 1965, (8). Each soil mapping unit was rated against the five soil textural groups, the required square feet of leaching area per 100 gallons of effluent, and the maximum absorption capacity. Only the leaching area is given in table 6. The standards used are as follows:

Soil type:	Required sq. ft. of leaching area per 100 gal. effluent	Maximum absorption capacity in gal. per sq. ft. leaching area
Coarse sand or gravel	20	5.00
Fine sand	25	4.00
Sandy loam or sandy clay	40	2.50
Clay containing much sand or gravel	60	1.66
Clay containing small amount of gravel	90	1.11

Soil limitations for low building foundations relate to table 28-B-Allowable soil pressure, p. 381, of the Uniform Building Code, 1967 edition (9). The limitations are based on the texture of the soil and on its consistence when dry. Hard non-expansive clays have a rating of slight; loose sands, a rating of severe; and other types of soils, a rating of moderate.

Engineering interpretations

Table 7 rates the soils according to their suitability as a source of topsoil, sand and gravel, and road fill. It also gives features that affect suitability of the soils as sites for roads, water-retention structures, and irrigation systems. Then the hydrologic soil group is given. The soil features listed are those that are important for construction, operation, or maintenance of the structure or practice shown. They should be taken into account in considering a soil for the stated use. Gullied land, Riverwash, Rock land, Rough broken land, Sandy alluvial land, and Terrace escarpments are not listed in the table. These land types are too variable in characteristics to be rated or otherwise are not suitable for engineering.

Because the estimates in table 7 are for a typical profile, some variations from the values given should be expected. A description of a typical profile for each series in the survey area is in the section "Descriptions of the Soils."

Agriculture drainage is not listed in table 7. The water level in the Area is declining as the result of increased pumping of ground water for irrigation. Consequently, such soils as the Merrill, Oban, Pond, Sunrise, and Tray, no longer are affected by adverse drainage. Chino loam is the only soil now somewhat affected by adverse drainage.

The ratings used for the soils as a source of topsoil, sand and gravel, and road fill are good, fair, poor, or not suitable.

Ratings of the soils as a source of topsoil are for use on slopes, shoulders of roads, areas along waterways, and on lawns or golf courses. The ratings are according to suitability of the soils for growth of vegetation. The information is useful to nurserymen, landscape architects, highway engineers, and others who are interested in locating soil material suitable for establishing vegetation.

In rating the soils as a source of sand and gravel, their suitability as a source of construction material for concrete aggregate, plaster, mortar, and similar uses was considered. Also considered was suitability of the soils for use as road fill when excavated and for use as fill for road subgrade material.

Some of the features that adversely affect the location of roads are a high water table, soil texture, steep slopes, shrink-swell potential, and depth to bedrock or hardpan. In the middle, southwestern, and northwestern parts of the survey area, the soils generally are shallow over bedrock; but in valleys in the northeastern part of the Area, the soils on alluvium are much deeper. In upland soils extra care is needed if cuts are made to a depth of more than 5 feet and hard bedrock is not reached before that depth. At a depth below 5 feet, onsite investigation may be required and a soils engineer or geologist may need to be consulted.

Among the water-retention structures considered in table 7 are fish ponds, stock-water ponds, irrigation reservoirs, recreation lakes, and sewage lagoons. Soil features affecting both the floor, or impoundment area, and the embankment need to be considered. Among the soil features affecting the floor are permeability, slope, depth to rock or the water table, and drainage. The major soil features affecting embankment material are strength, or shear resistance; stability; piping, or subsurface erosion; and cracking. The stability of a soil, or its resistance to sloughing and erosion, is important in excavating and in fill slopes. If a soil has low stability, careful investigation at the site is required before construction is started.

Suitability of a soil for irrigation is based chiefly on its rate of intake, water-holding capacity, slope, and depth. Also considered are permeability and need for leaching.

Engineers and soil scientists have classified the soil series in the survey area into four hydrologic groups. The grouping is based on estimates of the intake of water during the latter part of a storm of lond duration, after the soil profile is wet and has an opportunity to swell, without the protective effect of any vegetation. The grouping is tentative and subject to change as further data and experience are gained. The four groups are:

Group A consists of soils that have a high infiltration rate when thoroughly wetted. These soils have a high rate of water transmission and low runoff potential. They are deep, are well drained or excessively drained, and consist chiefly of sand, gravel, or both.

Group B soils have a moderate infiltration rate when thoroughly wetted. These soils have a moderate rate of water transmission and moderate runoff potential. They are moderately deep or deep, are moderately well drained or well drained, and are medium textured to moderately coarse textured.

Group C soils have a slow infiltration rate when thoroughly wetted. These soils have a slow rate of water transmission and high runoff potential. They have a layer that impedes downward movement of water, or they are moderately fine textured or fine textured and have a slow infiltration rate.

Group D soils have a slow infiltration rate when thoroughly wetted. The rate of water transmission is very slow, and runoff potential is very high. In this group are (1) clay soils that have high shrink-swell potential; (2) soils that have a permanent high water table; (3) soils that have a claypan or clay layer at or near the surface; and (4) soils that are shallow over nearly impervious material.

[Tests performed by District VII, California Division of Highways, in accordance with procedures given in "California linear extensibility, and bulk density, which were made by the U.S. Department of

Soil series and California report No.	Depth	Classification: USDA 1/	Classification: AASHO 2/	Classification: Unified 3/	Moisture density 4/: Maximum dry density	Moisture density 4/: Optimum moisture	Mechanical analysis 5/ — Percentage passing sieve--: 3 in.	3/4 in.	No. 4 (4.7 mm.)	No. 8 (2.38 mm.)	No. 30 (0.59 mm.)	No. 50 (0.297 mm.)
	Inches				Lb. per cu. ft.	Percent						
Adelanto: S65-19-28-1, 4.	0-16	Coarse sandy loam.	A-2-4(0)	SM	118	11	--	--	100	98	80	63
	41-50	Heavy sandy loam.	A-2-4(0)	SM	128	10	--	--	99	97	80	65
Ayar: S65-19-66-2.	13-40	Silty clay--	A-7-5(20)	CH	106	18	--	--	100	99	96	94
Balcom: S65-19-11-1,2,3.	0-10	Silty clay loam.	A-7-5(9)	ML-CL	107	17	--	--	---	100	98	98
	10-28	Silty clay loam.	A-7-5(11)	ML-CL	112	16	--	--	100	99	93	91
	28-38	Shale, clay loam.	A-7-5(12)	ML-CL	108	20	--	--	---	100	98	98
Balcom 14/: S65-19-19-1,2,3.	0-4	Silty clay loam.	A-7-5(15)	MH	100	21	--	--	99	98	94	92
	4-20	Silty clay loam.	A-7-6(14)	ML	106	21	--	--	99	98	95	94
	20-48	Silty clay loam.	A-7-5(16)	CH	106	17	--	--	99	98	96	95
Cajon: S65-19-34-2.	9-24	Fine sand----	A-1-b(0)	SW	114	13	--	--	99	96	60	29
Castaic 14/: S65-19-7-2,3,4,5.	1½-7	Silty clay loam.	A-7-5(10)	ML	104	21	--	--	---	---	99	95
	7-19	Silty clay loam.	A-7-5(9)	ML	103	21	--	--	---	---	98	89
	19-43	Silty clay loam.	A-7-5(9)	ML	102	20	--	--	---	100	97	89
	43	Clay loam----	---------	----	---	--	--	--	---	---	--	--

See footnotes at end of table.

Materials Manual for Testing and Control Procedures" (4), except for tests for potential volume change, coefficient of Agriculture, Soil Sonservation Service, Soil Survey Laboratory, Riverside, Calif.]

Mechanical analysis 5/--Continued						Liquid limit 6/	Plasticity index 6/	Dry density 7/		Potential volume change 8/	Coefficient of linear extensibility 9/	Bulk density value 10/	R value 11/
Percentage passing sieve--Con.		Percentage less than--						Maximum dry density	Optimum moisture				
No. 100 (0.149 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			Lb. per cu. ft.	Percent	Percent	In. per in.		
41	21	15	19	4	2	--	(12/)	---	--	---	----	----	78
48	32	28	19	13	10	--	(12/)	129	10	0.5	----	----	46
91	88	86	81	64	46	67	42	103	20	18.0	0.120	1.80	6
96	93	90	51	34	14	37	12	110	16	13.5	.035	1.34	18
88	83	82	53	22	(13/)	41	16	111	16	3.0	.037	1.37	21
96	93	90	51	24	14	46	17	110	16	1.0	.055	1.99	25
89	84	82	67	48	29	54	19	96	22	---	----	----	12
92	88	86	72	55	(13/)	49	20	107	19	10.1	----	1.70	7
93	90	88	81	67	(13/)	51	24	108	18	9.3	----	1.78	5
10	5	4	2	1	1	--	(12/)	---	--	---	----	----	81
84	73	70	53	32	21	44	14	104	19	7.0	.067	1.60	12
75	67	60	50	(13/)	(13/)	46	15	103	21	6.4	.056	1.53	11
75	65	62	50	(13/)	(13/)	46	16	103	21	6.8	.055	1.61	9
--	--	--	--	--	--	--	--	---	--	4.0	.076	1.78	--

Soil series and California report No.	Depth	Classification			Moisture density 4/		Mechanical analysis 5/					
		USDA 1/	AASHO 2/	Unified 3/	Maximum dry density	Optimum moisture	Percentage passing sieve--					
							3 in.	3/4 in.	No. 4 (4.7 mm.)	No. 8 (2.38 mm.)	No. 30 (0.59 mm.)	No. 50 (0.297 mm.)
	Inches				Lb. per cu. ft.	Percent						
Chino: S66-19-9-2,3.	16-28	Silty clay loam.	A-7-5(13)	CL	113	16	--	--	100	99	92	85
	28-52	Clay loam----	A-6(3)	SM-SC	112	17	--	--	100	92	74	61
Gazos: S65-19-2-1,2.	0-14	Light clay loam.	A-4(3)	ML	89	25	--	100	92	86	72	66
	14-24	Clay loam----	A-6(5)	ML	97	22	--	--	94	86	76	70
Gorman: S65-19-32-2,6.	5-16	Heavy sandy loam.	A-2-4(0)	SM	130	9	--	100	97	92	70	56
	54-65	Sandy clay loam.	A-2-4(0)	SM	126	11	--	99	95	91	68	57
Greenfield: S65-19-25-2,4.	5-20	Coarse sandy loam.	A-2-4(0)	SM	134	8	--	--	100	97	74	57
	29-60	Heavy sandy loam.	A-2-4(0)	SM	133	9	--	99	96	92	67	51
Hanford: 14/ S65-19-5-2.	6-19	Sandy loam---	A-2-4(0)	SM	117	14	--	100	99	98	90	76
Hesperia: S65-19-23-3.	22-54	Fine sandy loam.	A-2-4(0)	SM	118	13	--	--	100	99	85	73
Hi Vista: S66-19-1-3.	11-21	Sandy clay loam.	A-2-7(2)	SC	126	11	--	100	90	72	51	46
Metz: S65-19-15-2.	7-38	Loamy sand---	A-1-b(0)	SP-SM	116	12	100	99	92	86	59	32
Mocho: S65-19-18-3.	15-29	Loam---------	A-6(7)	CL	115	15	--	100	99	98	91	86

See footnotes at end of table.

Mechanical analysis 5/--Continued: Percentage passing sieve--Con.: No. 100 (0.149 mm.)	No. 200 (0.074 mm.)	Percentage less than--: 0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	Liquid limit 6/	Plasticity index 6/	Dry density 7/: Maximum dry density	Optimum moisture	Potential volume change 8/	Coefficient of linear extensibility 9/	Bulk density value 10/	R value 11/
								Lb. per cu. ft.	Percent	Percent	In. per in.		
77	68	65	56	40	29	44	19	111	15	10.7	0.069	1.75	7
52	45	42	39	30	22	39	13	110	18	9.1	.032	1.67	6
58	50	46	34	17	8	--	(12/)	84	31	---	----	----	40
63	55	51	36	21	11	40	11	95	22	---	----	----	30
42	31	28	18	12	8	--	(12/)	128	9	1.5	----	----	72
44	33	30	23	16	10	--	(12/)	128	10	4.9	.014	1.63	29
42	31	27	17	9	7	--	(12/)	128	9	.9	----	----	81
36	28	25	17	11	9	--	(12/)	130	9	1.1	----	----	41
50	30	24	11	5	3	--	(12/)	119	11	---	----	----	78
52	27	20	12	11	3	--	(12/)	123	9	.1	----	----	82
38	33	33	28	23	20	41	19	122	11	4.8	.058	1.72	13
13	6	--	--	--	(15/)	--	(12/)	114	11	---	----	----	81
79	67	61	39	22	15	32	11	118	13	---	----	----	38

Soil series and California report No.	Depth	Classification			Moisture density 4/		Mechanical analysis 5/					
							Percentage passing sieve--					
		1/ USDA	2/ AASHO	3/ Unified	Maximum dry density	Optimum moisture	3 in.	3/4 in.	No. 4 (4.7 mm.)	No. 8 (2.38 mm.)	No. 30 (0.59 mm.)	No. 50 (0.297 mm.)
	Inches				Lb. per cu. ft.	Percent						
Oban: S65-19-30-2,4.	4-14	Heavy clay loam.	A-6(9)	CL	116	14	--	--	100	99	89	81
	25-31	Heavy loam---	A-6(1)	SC	123	11	--	100	96	90	68	54
14/ Ojai: S65-19-16-1,3,4.	0-12	Loam---------	A-4(1)	SM	123	10	100	99	92	87	64	54
	19-33	Clay loam----	A-6(5)	CL	121	12	100	95	91	85	70	61
	33-48	Sandy clay loam.	A-2-4(0)	SC	129	10	100	94	81	67	35	25
14/ Ojai: S65-19-17-1,3,4.	0-8	Loam---------	A-4(1)	SM	126	10	100	94	91	87	69	56
	13-30	Sandy clay loam.	A-2-6(1)	SC	126	11	100	95	81	72	48	38
	30-56	Sandy clay loam.	A-2-6(2)	GC	128	10	16/ 96	62	49	42	26	19
Ojai, thin surface variant: S65-19-10-2,4,6.	2-6	Loam---------	A-1-b(0)	SM	124	11	100	95	72	66	44	34
	12-27	Clay loam----	A-2-6(2)	SC	123	12	100	96	85	79	60	50
	38	Clay loam----	A-4(1)	SC	122	13	100	99	98	95	84	75
Pond: S66-19-12-2,4.	4-17	Clay loam----	A-7-6(20)	MH	89	28	--	--	--	100	99	98
	24-44	Silt loam----	A-7-6(20)	MH	92	29	--	--	--	100	98	98
Ramona: S65-19-24-3,4.	20-31	Loam---------	--------	--	--	--	--	--	--	--	--	--
	31-51	Sandy clay loam.	--------	--	--	--	--	--	--	--	--	--
Rosamond: S65-19-33-3.	8-28	Light silty clay loam.	A-4(3)	SM	125	11	--	--	--	--	99	96

See footnotes at end of table.

TEST DATA--Continued

Mechanical analysis 5/--Continued: Percentage passing sieve--Con.: No. 100 (0.149 mm.)	Percentage passing sieve--Con.: No. 200 (0.074 mm.)	Percentage less than--: 0.05 mm.	Percentage less than--: 0.02 mm.	Percentage less than--: 0.005 mm.	Percentage less than--: 0.002 mm.	Liquid limit 6/	Plasticity index 6/	Dry density 7/: Maximum dry density	Dry density 7/: Optimum moisture	Potential volume change 8/	Coefficient of linear extensibility 9/	Bulk density value 10/	R value 11/
								Lb. per cu. ft.	Percent	Percent	In. per in.		
74	68	65	57	48	37	33	15	115	15	14.9	----	1.79	3
42	36	35	29	19	12	34	16	123	11	15.3	----	----	14
47	39	36	17	7	15/ 7	--	(12/)	126	9	2.7	0.010	1.60	73
58	52	48	35	29	15/ 26	40	21	121	11	2.8	.041	1.85	11
19	16	14	9	8	15/ 8	27	11	128	10	.1	.016	1.77	37
45	37	34	22	15	15/ 8	--	(12/)	117	13	--	----	----	46
30	26	25	21	19	15/ 14	37	19	123	12	--	----	----	7
15	12	12	9	7	15/ 6	31	13	123	11	--	----	----	17
26	20	18	10	7	15/ 4	--	(12/)	120	11	--	----	----	25
41	35	33	26	21	15/ 17	40	19	118	13	--	----	----	5
52	36	31	19	9	15/ 5	28	9	117	13	--	----	----	11
97	93	89	70	55	52	81	36	86	30	14.6	.091	1.47	10
95	92	89	82	69	68	81	43	89	29	5.2	.070	1.47	13
--	--	--	--	--	--	--	--	127	9	1.1	----	----	63
--	--	--	--	--	--	--	--	129	10	3.8	.007	1.92	29
79	49	42	33	24	16	--	(12/)	118	14	2.2	.023	1.50	13

Soil series and California report No.	Depth	Classification			Moisture density 4/		Mechanical analysis 5/					
		USDA 1/	AASHO 2/	Unified 3/	Maximum dry density	Optimum moisture	Percentage passing sieve-- 3 in.	3/4 in.	No. 4 (4.7 mm.)	No. 8 (2.38 mm.)	No. 30 (0.59 mm.)	No. 50 (0.297 mm.)
	Inches				Lb. per cu. ft.	Percent						
Saugus:												
S65-19-4-1,2,3.	0-15	Loam----------	A-1-b(0)	SM	127	10	100	96	82	73	52	41
	15-25	Loam----------	A-2-4(0)	SM	128	10	100	98	86	81	65	52
	25-42	Loam----------	A-2-4(0)	SM	130	9	100	97	85	82	59	49
Sorrento:												
S65-19-14-3.	14-40	Loam----------	A-4(8)	ML	111	11	--	--	--	--	99	98
Sunrise:												
S65-19-31-4.	31-39	Loam----------	A-6(4)	ML	116	14	--	100	99	97	85	74
Tray:												
S65-19-29-2,3.	8-20	Heavy sandy loam.	A-2-4(0)	SM	132	9	--	100	99	93	68	54
	20-32	Sandy loam---	A-2-4(0)	SM	135	8	--	--	98	92	64	51
Vernalis:												
S65-19-27-3.	14-35	Loam----------	A-6(5)	CL	119	13	--	--	100	99	92	86
Vista:												
S65-19-26-1.	0-16	Coarse sandy loam.	A-2-4(0)	SM	133	9	--	--	98	93	63	46
Wyman:												
S66-19-22-2,4.	3-10	Gravelly loam.	A-2-4(0)	SM	140	7	--	99	91	85	65	55
	24-41	Gravelly clay loam.	A-2-4(0)	SM	139	8	100	17/ 95	85	80	59	48
Yolo:												
S65-19-12-1,3.	0-6	Loam----------	A-4(8)	CL	114	15	--	--	--	--	99	98
	18-36	Loam----------	A-6(8)	ML	113	15	--	--	--	--	99	98

See footnotes at end of table.

Mechanical analysis 5/--Continued: Percentage passing sieve--Con.: No. 100 (0.149 mm.)	No. 200 (0.074 mm.)	Percentage less than--: 0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	Liquid limit 6/	Plasticity index 6/	Dry density 7/: Maximum dry density	Optimum moisture	Potential volume change 8/	Coefficient of linear extensibility 9/	Bulk density value 10/	R value 11/
								Lb. per cu. ft.	Percent	Percent	In. per in.		
30	22	19	12	9	15/ 6	--	(12/)	121	11	1.5	0.022	1.44	46
39	29	25	13	8	15/ 8	--	(12/)	126	9	.3	.018	1.47	26
35	25	23	16	12	15/ 8	--	(12/)	126	10	.1	.022	1.54	23
93	79	71	43	22	13	--	(12/)	115	13	--	----	----	23
61	50	47	37	25	16	29	12	106	18	.5	.003	1.35	72
41	31	27	18	11	8	--	(12/)	130	9	4.1	----	----	10
36	25	23	13	7	5	--	(12/)	---	--	--	----	----	18
74	59	55	44	27	19	27	11	124	11	9.5	.025	1.63	14
31	22	19	13	8	5	--	(12/)	---	--	--	----	----	61
44	34	30	16	9	5	--	(12/)	135	8	.7	----	----	71
38	31	30	18	12	9	23	5	133	10	3.8	.011	1.83	22
95	87	81	50	27	18	30	9	112	14	9.1	.029	1.46	13
96	89	83	58	28	18	37	11	111	15	7.4	.035	1.38	13

Soil series and California report No.	Depth	Classification: USDA 1/	Classification: AASHO 2/	Classification: Unified 3/	Moisture density 4/: Maximum dry density	Moisture density 4/: Optimum moisture	Mechanical analysis 5/ — Percentage passing sieve--: 3 in.	3/4 in.	No. 4 (4.7 mm.)	No. 8 (2.38 mm.)	No. 30 (0.59 mm.)	No. 50 (0.297 mm.)
	Inches				Lb. per cu. ft.	Percent						
Zamora:												
S65-19-3-2,4,5.	3-11	Loam---------	A-4(5)	ML	126	11	--	--	98	96	87	80
	16-35	Clay loam----	A-4(5)	CL-ML	122	11	--	--	99	97	89	81
	35-58	Loam---------	A-4(5)	ML	120	13	--	100	99	97	89	82
Zamora: 14/												
S65-19-12-1,2,3,4, 5,6.	0-6	Clay loam----	A-4(5)	ML	119	12	--	--	99	97	89	84
	6-10	Clay loam----	--------	--	--	--	--	--	--	--	--	--
	10-30	Clay loam----	A-6(5)	CL	123	11	--	--	99	98	90	84
	30-41	Clay loam----	--------	--	--	--	--	--	--	--	--	--
	41-80	Loam---------	--------	--	--	--	--	--	--	--	--	--
	80	Silty clay---	--------	--	--	--	--	--	--	--	--	--

1/ By field determination. Mechanical analysis by the California Division of Highways (4). Results by this procedure frequently may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the California procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that material coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from the calculations of the grain-size fractions.

2/ Based on American Association of Highway Officials Designation: M145-49(1).

3/ Based on the Unified soil classification system (22). SCS and Bureau of Public Roads have agreed to consider that all soils having plasticity indexes within two points from A-line are to be given a borderline classification. Examples of borderline classifications obtained by this use are SM-SC and ML-CL.

4/ Based on California Division of Highways: Method No. 216E.

5/ Based on California Division of Highways: Methods No. 202 and 203.

6/ Based on California Division of Highways: Method No. 204.

7/ Based on American Society for Testing Materials Designation: D-1557-58T, Method A, modified by using a three-layer procedure, rather than the 5-layer procedure of the California Division of Highways.

8/ Potential volume change tests according to section 2803(d) of the Los Angeles County Building Code (9).

TEST DATA--Continued

Mechanical analysis 5/--Continued: Percentage passing sieve--Con.: No. 100 (0.149 mm.)	No. 200 (0.074 mm.)	Percentage less than--: 0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	Liquid limit 6/	Plasticity index 6/	Dry density 7/: Maximum dry density	Optimum moisture	Potential volume change 8/	Coefficient of linear extensibility 9/	Bulk density value 10/	R value 11/
								Lb. per cu. ft.	Percent	Percent	In. per in.		
70	60	54	29	16	12	--	(12/)	124	11	--	----	----	15
71	59	56	33	21	19	25	7	123	11	--	----	----	17
72	59	56	34	20	16	--	(12/)	123	11	--	----	----	15
73	61	59	37	23	19	--	(12/)	119	11	12.7	0.029	1.77	16
--	--	--	--	--	--	--	--	--	--	5.8	.036	1.71	--
74	62	58	38	26	21	28	11	122	11	4.2	.035	1.77	31
--	--	--	--	--	--	--	--	--	--	3.5	.028	1.86	--
--	--	--	--	--	--	--	--	--	--	.2	.033	1.81	--
--	--	--	--	--	--	--	--	--	--	9.1	.109	1.89	--

9/ Includes whole soil (all size fractions).

10/ Determined by duplicate and average Saran-coated clods on ovendry basis; in place densities may differ.

11/ Based on California Division of Highways: Method No. 301-F.

12/ Nonplastic.

13/ The percentage of material smaller than 0.002 millimeter could not be determined by hydrometer analysis because of flocculation due to the presence of lime. The percentage of material smaller than 0.005 millimeter may be slightly influenced by the presence of lime.

14/ Different profile than that described as typical of the series.

15/ Values reflect material larger than 3/4 inch not included with samples sent to California State Division of Highways.

16/ In this sample 100 percent passed the larger than 3-inch sieve.

17/ In this sample 97 percent passed the 1½-inch sieve.

TABLE 6.--ESTIMATED

[Not included in this table, because their characteristics are too variable to be classified, Sandy alluvial land (Sa), and Terrace escarpments (TsF). Dashes

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Adelanto: AaB, AcA, AdB--	5+	0-86	Sandy loam that is gravelly in places.	SM	A-2	95-100	70-100	65-100	50-75	20-35
Agua Dulce: AgF----------	3-5	0-20	Stony, cobbly, and gravelly clay loam.	GC	A-4	70-80	60-70	50-60	45-55	35-50
		20-40	Very gravelly loamy coarse sand.	GP	A-1	85-100	30-50	25-45	15-25	0-5
		40	Conglomerate.							
Amargosa: AmF2-----------	1-1½	0-18	Coarse sandy loam.	SM	A-2	95-100	85-95	80-90	50-60	20-30
		18	Granitic rock.							
Anaverde: AnE, ApF--------	3-5	0-55	Loam and clay loam.	ML or CL	A-4 or A-6	95-100	90-95	85-95	75-85	50-60
		55	Schist.							
Arizo:										
AsB----------------------	5+	0-60	Very gravelly and cobbly loamy sand.	GP or SP	A-1	60-75	15-55	10-50	5-15	0-10
AtA----------------------	5+	0-24	Loamy fine sand.	SP or SW	A-3	100	95-100	90-100	50-75	0-10
		24-60	Very gravelly and cobbly loamy sand.	GP or SP	A-1	60-75	15-55	10-50	5-15	0-10
Ayar: AyD----------------	5+	0-40	Silty clay--	CH	A-7	100	100	95-100	90-95	85-90
		40-62	Clay loam---	CL	A-6	100	100	100	70-80	60-70

See footnote at end of table.

PROPERTIES OF THE SOILS
are the land types Gullied land (GuF), Riverwash (Rg), Rock land (RhF), Rough broken land (RzF),
indicate a determination was not made or that it would not be applicable]

Atterberg values: Liquid limit	Atterberg values: Plastic index	Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------	(1/)	0.63-2.00	0.08-0.15	6.1-8.4	0-2	Low------	Low--------	40	Moderate.
30-40	15-20	0.20-0.63	0.09-0.11	6.1-6.5	0-2	Low------	Low--------	40	Moderate.
------	(1/)	6.30-20.0	0.04-0.06	6.1-6.5	0-2	Low------	Low--------	20	Slight.
------	(1/)	2.00-6.30	0.08-0.10	6.1-6.5	0-2	Low------	Low--------	40	Moderate.
25-30	5-15	0.63-2.00	0.15-0.17	6.1-6.5	0-2	Moderate-	Moderate---	40	Severe.
------	(1/)	20.0+	0.04-0.05	6.6-7.8	0-2	Low------	Low--------	20	Severe.
------	(1/)	0.63-20.0	0.07-0.09	6.6-7.3	0-2	Low------	Low--------	25	Severe.
------	(1/)	20.0+	0.04-0.06	7.4-7.8	0-2	Low------	Low--------	20	Severe.
65-70	40-45	0.06-0.20	0.13-0.15	7.9-9.0	0-2	High-----	High-------	40	Moderate.
30-40	15-25	0.20-0.63	0.17-0.19	8.5-9.0	0-2	Moderate-	Moderate---	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Balcom-------------------- (Mapped only with Castaic soils.)	2-3½	0-28	Silty clay loam.	ML or CL	A-7	100	90-95	85-95	80-95	75-85
		28	Weathered shale.							
Cajon:										
CaA, CaC, CcA2, CcD2-----	5+	0-60	Loamy sand to sand.	SW-SP	A-1	100	95-100	90-100	40-50	0-10
CbA----------------------	5+	0-36	Loamy sand--	SW-SP	A-1	100	95-100	90-100	40-50	0-10
		36-52	Loam--------	ML	A-4	100	100	100	85-95	50-60
		52-60	Loamy sand--	SW-SP	A-1	100	95-100	90-100	40-50	0-10
Calvista: ChC, ChE------- (For properties of Hi Vista soils in these mapping units, refer to Hi Vista series in this table.)	1-1½	0-16	Sandy loam--	SM	A-2	95-100	90-100	85-100	60-70	25-35
		16	Hard granitic rock.							
Castaic: CkC, CkD, CmD, CmE, CmF, CmF2, CmG2, CnG3. (For properties of Balcom soils in mapping units CmD through CmG2, refer to Balcom series in this table; and for properties of Saugus soils in mapping unit CnG3, refer to Saugus series in this table.)	1½-3½	0-26	Silty clay loam.	ML or CL	A-7	100	95-100	85-95	80-90	65-75
		26	Weathered shale.							
Chino: Co----------------	5+	0-60	Loam, silty clay loam, and clay loam.	ML or CL	A-6	100	95-100	95-100	85-95	60-70

See footnote at end of table.

Atterberg values		Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
Liquid limit	Plastic index								
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
40-50	10-20	0.20-0.63	0.18-0.20	7.4-8.4	0-2	Moderate-	Moderate--	40	Moderate.
------	(1/)	6.30-20.0	0.06-0.08	6.6-8.4	0-2	Low------	Low-------	25	Severe.
------	(1/)	6.30-20.0	0.06-0.08	6.6-7.3	0-2	Low------	Low-------	25	Severe.
------	(1/)	0.63-2.00	0.14-0.16	7.9-8.4	0-2	Moderate-	Low-------	40	Moderate.
------	(1/)	6.30-20.0	0.06-0.08	7.9-8.4	0-2	Low------	Low-------	25	Severe.
------	(1/)	2.00-6.30	0.10-0.12	7.9-8.4	0-2	Low------	Low-------	40	Moderate.
40-50	10-20	0.20-0.63	0.18-0.20	6.6-8.4	0-2	Moderate-	Moderate---	40	Moderate.
30-40	10-15	0.20-0.63	0.18-0.20	7.9-9.5	4-16	Moderate-	High-------	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Cortina: CyA, CyC--------	5+	0-20	Sandy loam--	SM	A-2	95-100	95-100	95-100	60-70	20-30
		20-60	Very cobbly sandy loam.	GW or GP	A-1	40-60	15-25	5-15	0-5	0-5
CzC----------------------	5+	0-60	Very gravelly and very cobbly sandy loam.	GW or GP	A-1	40-60	15-25	5-15	0-5	0-5
Dune land: DuD-----------	5+	0-60	Sand or fine sand.	SP	A-3	100	95-100	90-95	50-70	0-10
Gaviota: GaE2, GaF2------	1-1½	0-14	Sandy loam--	SM	A-2	100	95-100	90-100	60-70	20-30
		14	Hard sandstone.							
Gazos: GbF---------------	1½-3½	0-24	Clay loam---	ML or CL	A-4 or A-6	95-100	90-100	80-90	60-70	50-65
		24	Shattered, hard shale.							
Godde: GcE, GdF----------	1-1½	0-16	Loam--------	ML or CL	A-4 or A-6	90-100	90-95	85-95	60-70	50-60
		16	Hard schist.							
Gorman: GoD, GoD2, GoE2, GoF2.	4-5	0-84	Heavy sandy loam to sandy clay loam.	SM or SC	A-2	100	90-100	85-90	60-80	25-35
Greenfield: GsA, GsC, GsC2, GsD2.	5+	0-60	Sandy loam or heavy sandy loam.	SM	A-2	95-100	95-100	90-100	60-70	25-35

See footnote at end of table.

Atterberg values		Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
Liquid limit	Plastic index								
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------ ------	(1/) (1/)	2.00-6.30 6.30-20.0	0.10-0.12 0.03-0.05	6.1-7.3 6.6-7.8	0-2 0-2	Low------ Low------	Low-------- Low--------	20 20	Moderate. Moderate.
-----	(1/)	6.30-20.0	0.04-0.06	6.1-7.8	0-2	Low------	Low--------	20	Moderate.
------	(1/)	20.0+	0.05-0.07	6.6-8.4	0-2	Low-------	Low--------	25	Severe.
------	(1/)	2.00-6.30	0.10-0.12	6.1-7.3	0-2	Low------	Low--------	40	Moderate.
30-40	5-15	0.20-0.63	0.17-0.19	6.1-7.3	0-2	Moderate-	Moderate---	40	Moderate.
25-30	5-15	0.63-2.00	0.14-0.16	5.6-6.5	0-2	Moderate-	Low--------	40	Moderate.
0-5	(1/)	0.20-0.63	0.14-0.16	5.1-7.3	0-2	Low------	Moderate--	40	Moderate.
------	(1/)	2.00-6.30	0.12-0.15	6.1-7.3	0-2	Low------	Low--------	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Hanford:										
HaB2----------------------	5+	0-24	Loamy sand---	SP-SW	A-3	100	90-95	85-95	50-60	5-10
		24-60	Coarse sandy loam.	SM	A-2	100	90-95	90-95	60-70	25-35
HbA, HbC, HbD------------	5+	0-39	Coarse sandy loam.	SM	A-2	100	90-95	90-95	60-70	25-35
		39-70	Gravelly loamy coarse sand.	SP-SW	A-1	100	80-95	75-90	40-50	5-10
HcA, HcC, HeC------------	5+	0-60	Stratified sandy loam, coarse sandy loam, fine sandy loam, and loam.	SM	A-2	100	95-100	90-100	60-70	25-35
HdC----------------------	5+	0-60	Gravelly sandy loam.	GM or SM	A-2	95-100	65-90	65-80	25-45	10-20
HfA----------------------	5+	0-60	Loam---------	ML or CL	A-4	100	95-100	95-100	85-95	60-75
Hesperia:										
HgA, HgA2, HgB-----------	5+	0-16	Loamy fine sand.	SM	A-2	100	95-100	95-100	60-80	15-25
		16-77	Sandy loam or fine sandy loam.	SM	A-2	100	95-100	95-100	75-85	25-35
HkA, HkB, HnA------------	5+	0-77	Fine sandy loam or sandy loam; surface layer is loam in places.	SM	A-2	100	95-100	95-100	75-85	25-35
HmA----------------------	5+	0-36	Fine sandy loam.	SM	A-2	100	95-100	95-100	75-85	25-30
		36-77	Loam and clay loam stratified in many areas.	ML	A-4	100	100	100	85-95	50-60

See footnote at end of table.

Atterberg values: Liquid limit	Atterberg values: Plastic index	Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------	(1/)	2.00-6.30	0.07-0.09	6.1-6.5	0-2	Low-------	Low--------	25	Severe.
------	(1/)	2.00-6.30	0.10-0.12	6.1-7.8	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.10-0.12	6.1-7.3	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	20.0+	0.06-0.08	6.6-7.8	0-2	Low-------	Low--------	20	Moderate.
------	(1/)	2.00-6.30	0.13-0.15	6.1-8.4	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.08-0.11	6.1-7.8	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	0.63-2.00	0.14-0.16	6.6-7.3	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	6.30-20.0	0.07-0.09	6.1-6.5	0-2	Low-------	Low--------	25	Severe.
------	(1/)	2.00-6.30	0.13-0.15	7.9-8.4	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.13-0.15	6.1-8.4	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.13-0.15	6.1-7.8	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	0.63-2.00	0.15-0.17	7.9-8.4	0-2	Moderate--	Low to moderate.	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Hi Vista------------------ (Mapped only with Calvista soils.)	2-3	0-29	Sandy clay loam.	SC	A-2	100	95-100	90-100	60-75	25-35
		29	Hard granitic rock.							
Las Posas: LaE, LdF-------- (For Properties of Toomes soils in mapping unit LdF, refer to Toomes series in this table.)	2-2½	0-24	Heavy clay loam.	ML or CL	A-6 or A-7	90-95	80-90	75-85	70-80	65-75
		24	Hard basalt and tuff.							
Lebec: LeF----------------	2-4	0-39	Heavy loam that includes some gravel.	SM or SC	A-4	100	85-95	80-90	60-70	40-50
		39	Hard limestone.							
Merrill: Me---------------	5+	0-25	Stratified sandy loam and clay loam.	CL	A-6	100	95-100	95-100	85-95	60-70
		25	Loam that is 30 to 50 percent lime concretions.	SM or SC	A-2	100	55-75	50-70	40-65	25-35
Metz:										
MfA, MfC------------------	5+	0-60	Loamy sand and sand.	SM	A-1	95-100	90-95	85-95	40-50	5-10
MgA, MgB------------------	5+	0-10	Loam---------	CL or ML	A-4	100	95-100	95-100	85-95	60-75
		10-60	Loamy sand and sand.	SM	A-1	95-100	90-95	85-95	40-50	0-10
Millsholm: MhE2, MhF2-----	1-1½	0-16	Loam---------	ML or CL	A-4	100	95-100	90-100	85-95	55-70
		16	Hard sandstone and shale.							

See footnote at end of table.

Atterberg values		Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
Liquid limit	Plastic index								
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
40-45	15-20	0.20-0.63	0.14-0.17	6.6-8.4	0-2	Moderate--	Moderate---	40	Moderate.
35-45	10-25	0.20-0.63	0.17-0.19	6.1-7.8	0-2	High------	High-------	40	Moderate.
5-10	5-10	0.63-2.00	0.13-0.17	7.9-8.4	0-2	Moderate--	Low--------	40	Moderate.
20-35	15-30	0.20-2.00	0.16-0.18	7.9-9.0	0-16	Moderate--	High-------	40	Moderate.
0-10	5-15	0.63-2.00	0.08-0.10	8.5-9.0	0-16	Moderate--	High-------	40	Moderate.
------	(1/)	6.30-20.0	0.07-0.09	6.6-7.8	0-2	Low-------	Low--------	25	Severe.
------	(1/)	0.63-2.00	0.15-0.16	7.4-7.8	0-2	Moderate--	Low--------	40	Moderate.
------	(1/)	6.30-20.0	0.07-0.08	6.6-7.8	0-2	Low-------	Low--------	25	Severe.
------	(1/)	0.63-2.00	0.14-0.16	6.1-7.3	0-2	Moderate--	Low--------	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Mocho: MoA, MpA, MpC------	5+	0-90	Loam---------	ML or CL	A-4 or A-6	100	95-100	95-100	85-95	60-70
Mohave: MzB----------------	5+	0-6	Coarse sandy loam.	SM	A-2	100	90-100	90-95	60-70	25-35
		6-42	Sandy clay loam.	SC or CL	A-6	100	95-100	90-100	80-90	40-60
		42-62	Loamy coarse sand that contains some gravel.	SM	A-2	95-100	75-100	80-100	50-75	15-30
Oakdale: OaC--------------	5+	0-52	Heavy sandy loam.	SM	A-2 or A-4	100	95-100	90-100	60-70	30-40
		52-70	Gravelly heavy sandy loam.	GM or SM	A-2	90-100	60-90	50-70	25-45	10-25
Oak Glen:										
ObA, ObC------------------	5+	0-70	Sandy loam---	SM	A-2	100	95-100	85-100	60-70	25-35
OcC-----------------------	5+	0-60	Gravelly sandy loam.	GM or SM	A-2	95-100	70-90	65-85	25-45	10-25
OdA, OdC------------------	5+	0-60	Loam---------	ML or CL	A-4	100	95-100	95-100	85-95	55-65
Oban---------------------- (Mapped only with Pond soils.)	5+	0-4	Fine sandy loam.	SM	A-4	100	95-100	95-100	65-80	35-50
		4-31	Heavy clay loam.	CL	A-6	100	95-100	95-100	90-100	65-80
		31-53	Gravelly coarse sand.	GW or SW	A-1	95-100	80-90	75-85	25-45	5-15

See footnote at end of table.

Atterberg values		Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
Liquid limit	Plastic index								
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
30-35	5-15	0.63-2.00	0.15-0.17	7.4-9.0	0-2	Moderate--	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.10-0.12	5.6-6.0	0-2	Low-------	Low--------	40	Severe.
30-40	15-20	0.20-0.63	0.14-0.16	6.1-8.4	0-2	Moderate--	Moderate---	40	Moderate.
------	(1/)	6.30-20.0	0.06-0.08	6.6-8.4	0-2	Low-------	Low--------	20	Moderate.
------	(1/)	0.63-2.00	0.13-0.15	6.1-7.3	0-2	Low-------	Low---------	40	Moderate.
------	(1/)	2.00-6.30	0.09-0.11	6.6-7.3	0-2	Low-------	Low---------	40	Moderate.
------	(1/)	2.00-6.30	0.10-0.12	5.6-6.5	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.08-0.10	5.6-6.5	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	0.63-2.00	0.14-0.17	6.1-6.5	0-2	Low--------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.12-0.14	7.9-8.4	8-16	Low-------	High-------	40	Moderate
30-40	15-20	0.06-0.20	0.18-0.21	9.0+	0-16+	High------	High-------	40	Moderate.
-----	(1/)	6.30-20.0	0.05-0.07	8.5-9.0	0-16+	Low-------	High-------	20	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Ojai: OgC, OgD, OgE, OgF, OgF2, OzE. (For properties of Zamora soils in mapping units OzE, refer to Zamora series in this table.)	5+	0-25	Loam---------	SC or CL	A-4	100	90-100	80-95	60-80	35-55
		25-53	Clay loam that contains some gravel.	SC or CL	A-2 or A-6	95-100	80-95	70-85	45-60	25-55
		53-60	Sandy loam that contains some gravel.	GC or SC	A-2	90-100	45-85	40-65	25-45	15-35
Ojai, thin surface variant: OhF----------------------	5+	0-6	Loam that contains a few pebbles.	SM or SC	A-1	100	70-80	60-65	35-50	20-25
		6-38	Clay loam that contains a few pebbles.	SC	A-6 or A-7	100	80-90	75-80	55-65	35-40
		38-50	Gravelly clay loam.	SC	A-4 or A-6	90-100	75-90	55-75	45-60	35-40
Pond: Po-----------------------	5+	0-4	Loam---------	ML	A-4	100	95-100	95-100	85-95	55-70
		4-24	Clay loam----	MH	A-7	100	95-100	95-100	90-100	90-100
		24-66	Silt loam----	MH	A-6	100	90-100	90-100	90-100	85-95
Ps, Px------------------- (For properties of Oban soils in mapping unit Px, refer to Oban series in this table.)	5+	0-6	Silty clay loam.	MH	A-7	100	100	95-100	95-100	85-95
		6-60	Clay loam----	MH	A-7	100	100	95-100	90-100	80-95

See footnote at end of table.

Atterberg values		Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
Liquid limit	Plastic index								
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------	(1/)	0.63-2.00	0.15-0.17	6.1-6.5	0-2	Low------	Low-------	40	Moderate.
35-40	15-25	0.20-0.63	0.17-0.18	6.1-7.3	0-2	Moderate-	Moderate--	40	Moderate.
30-35	10-15	2.00-6.30	0.09-0.10	6.1-7.3	0-2	Low------	Low-------	40	Moderate.
0-10	0-5	0.63-2.00	0.14-0.16	6.1-6.5	0-2	Low------	Low-------	40	Moderate.
35-45	12-25	0.20-0.63	0.16-0.18	6.1-7.3	0-2	Moderate-	Moderate--	40	Moderate.
25-30	5-15	0.63-2.00	0.15-0.16	6.1-7.8	0-2	Moderate-	Moderate--	40	Moderate.
10-15	10-15	0.63-2.00	0.15-0.16	7.9-8.4	4-16	Moderate-	Moderate--	40	Moderate.
75-85	30-40	0.20-0.63	0.17-0.18	9.0+	16+	High-----	High------	40	Moderate.
75-85	35-45	0.63-2.00	0.16-0.17	7.9+	16+	High-----	High------	40	Moderate.
75-85	30-40	0.20-0.63	0.19-0.20	8.5-9.0	16+	High-----	High------	40	Moderate.
80-85	35-40	0.20-0.63	0.17-0.19	9.0+	16+	High-----	High------	40	Moderate

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Ramona:										
RcA, RcB, RcC, RcD, RdE2--	5+	0-20	Coarse sandy loam or sandy loam.	SM	A-2	100	90-100	90-100	60-70	25-35
		20-51	Loam and sandy clay loam.	CL or SC	A-6	100	90-100	80-90	80-90	45-60
		51-90	Loam that contains a few pebbles.	SM or SC	A-4 or A-6	90-100	85-90	85-90	65-85	40-50
ReC, ReE------------------	5+	0-12	Gravelly sandy loam.	GM or SM	A-1	95-100	70-95	50-70	25-50	10-25
		12-36	Gravelly sandy clay loam.	GC or GL	A-6	85-95	75-85	75-85	60-80	45-65
		36-60	Gravelly coarse sandy loam.	GM	A-1	85-95	60-90	45-65	25-50	10-25
RfB, RfC,-----------------	5+	0-12	Loam---------	ML or CL	A-4 or A-6	100	90-100	95-100	85-95	55-65
		12-48	Light clay loam.	ML or CL	A-6	100	90-100	90-100	80-90	60-75
		48-60	Loam that contains a few pebbles.	SM or SC	A-4 or A-6.	90-100	85-90	85-90	65-85	40-50
Rosamond:										
Rm, Rm2-------------------	5+	0-16	Loamy fine sand.	SM	A-2	100	95-100	90-95	50-75	15-30
		16-60	Loam and light silty clay loam.	SM or SC	A-4	100	95-100	95-100	85-95	45-50
Ro, Rp, Rr----------------	5+	0-8	Sandy loam to loam.	SM	A-2 or A-4	100	95-100	95-100	60-85	25-40
		8-61	Light silty clay loam.	SM or SC	A-4	100	90-100	90-100	90-100	40-50
Rs------------------------	5+	0-44	Loam---------	SM	A-4	100	95-100	95-100	85-95	45-50
		44-60	Sandy loam or coarse loamy sand.	SM	A-2	100	90-100	90-100	60-70	20-30
Rt, Ru--------------------	5+	0-60	Silty clay loam to loam.	SM or SC	A-4	100	100	95-100	95-100	40-50

See footnote at end of table.

Atterberg values: Liquid limit	Atterberg values: Plastic index	Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------	(1/)	2.00-6.30	0.08-0.10	6.1-7.3	0-2	Low-------	Low--------	40	Moderate.
25-35	5-15	0.20-0.63	0.16-0.18	6.1-7.3	0-2	Low-------	Moderate---	40	Moderate.
20-30	5-15	0.63-2.00	0.14-0.16	6.6-7.3	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.06-0.08	6.1-6.5	0-2	Low-------	Low--------	40	Moderate.
25-35	10-20	0.20-0.63	0.14-0.17	6.6-7.3	0-2	Low-------	Moderate---	40	Moderate.
------	(1/)	2.00-6.30	0.06-0.08	6.6-7.3	0-2	Low-------	Low--------	40	Moderate.
15-30	5-15	0.63-2.00	0.15-0.17	6.1-6.5	0-2	Low-------	Low--------	40	Moderate.
30-40	15-20	0.20-0.63	0.17-0.19	6.6-7.3	0-2	Low-------	Moderate---	40	Moderate.
15-30	5-15	0.63-2.00	0.14-0.15	6.6-7.3	0-2	Low-------	Low--------	40	Moderate.
-----	(1/)	2.00-6.30	0.08-0.10	6.6-7.3	0-2	Low-------	Moderate---	25	Severe.
-----	(1/)	0.63-2.00	0.17-0.19	7.9-8.4	2-4	Moderate--	Moderate---	40	Moderate.
0-5	0-5	0.63-2.00	0.13-0.17	7.4-8.4	0-2	Low-------	Low--------	40	Moderate.
-----	(1/)	0.63-2.00	0.15-0.17	7.9-8.4	2-16	Low-------	High-------	40	Moderate.
-----	(1/)	0.63-2.00	0.16-0.18	7.9-8.4	2-8	Low-------	High-------	40	Moderate.
-----	(1/)	6.30-20.0	0.09-0.11	7.9-8.4	2-8	Low-------	High-------	40	Moderate.
-----	(1/)	0.63-2.0	0.18-0.20	7.9-9.0	2-16	Moderate--	High-------	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Saugus: ScE, ScF, ScF2----	3-5	0-42	Loam--------	SC or SM	A-2	90-100	80-90	70-85	45-65	20-35
		42	Weakly consolidated sediment consisting of sandy loam, a few pebbles, and in some places hard strata.							
Sheridan: ShE, ShE2, ShF, ShF2.	2-3	0-21	Sandy loam---	SM	A-2	95-100	90-100	80-95	60-70	20-25
		21-32	Gravelly sandy loam.	GM or SM	A-1	95-100	65-80	60-70	40-50	15-25
		32	Hard granitic rock.							
Soboba: SoB---------------	5+	0-60	Very cobbly loamy coarse sand.	GP	A-1	65-80	10-15	0-10	0-10	0-10
Sorrento: SsA, SsB--------	5+	0-72	Loam---------	ML	A-4	100	95-100	95-100	85-100	75-80
Sunrise: Su, Sv--------------------	5+	0-8	Sandy loam or loamy fine sand.	SM	A-2	100	95-100	90-95	70-85	25-35
		8-31	Fine sandy loam and loam.	ML or SC	A-4	100	95-100	90-100	85-95	45-55
		31-48	Caliche hardpan.							
Sw------------------------	5+	0-4	Sandy loam---	SM	A-2	100	95-100	90-95	60-70	20-35
		4-15	Loam---------	ML	A-4	100	95-100	90-100	85-95	55-65
		15-33	Caliche hardpan.							
Sx, Sy--------------------	5+	0-39	Loam---------	ML	A-4	95-100	95-100	90-100	85-95	55-65
		39-48	Caliche hardpan.							

See footnote at end of table.

Atterberg values		Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
Liquid limit	Plastic index								
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------	(1/)	0.63-2.00	0.14-0.16	6.1-7.3	0-2	Low------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.10-0.12	5.6-6.5	0-2	Low------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.06-0.08	5.6-6.5	0-2	Low------	Low--------	40	Moderate.
------	(1/)	20.0+	0.03-0.05	6.1-7.8	0-2	Low------	Low--------	20	Severe.
------	(1/)	0.63-2.00	0.14-0.17	7.4-8.4	0-2	Moderate--	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.07-0.08	7.4-8.4	0-2	Low------	Low--------	40	Moderate.
25-30	10-15	0.63-2.00	0.15-0.17	7.9-9.0	2-4	Low------	Moderate---	40	Moderate.
------	(1/)	2.00-6.30	0.09-0.10	7.4-7.8	0-2	Low------	Low--------	40	Moderate.
25-30	10-15	0.63-2.00	0.15-0.16	8.5-9.0	2-4	Low------	Moderate---	40	Moderate.
25-30	10-15	0.63-2.00	0.15-0.16	7.9-9.0	2-16	Low------	High-------	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Temescal: TrF------------	1-1½	0-20	Sandy loam----	SM	A-2	100	90-100	90-100	60-70	20-35
		20	Hard andesite.							
Toomes-------------------- (Mapped only with Las Posas soils.)	1-1½	0-17	Loam---------	ML	A-4	95-100	95-100	95-100	85-95	55-70
		17	Hard basalt.							
Tray:										
Tt2----------------------	5+	0-20	Fine sand----	SP-SW	A-2	100	100	90-95	65-80	15-25
		20-32	Heavy sandy loam.	SM	A-2	100	90-100	80-95	60-70	25-35
		32-60	Coarse sandy loam.	SM	A-2	100	90-100	90-100	60-70	10-35
Tu, Tv, Tw---------------	5+	0-32	Sandy loam or loam.	SM	A-2	100	100	85-100	60-70	20-35
		32-70	Coarse sandy loam.	SM	A-2	100	90-100	90-100	60-70	10-35
Vernalis:										
VaA----------------------	5+	0-12	Sandy loam----	SM	A-2	100	95-100	95-100	60-70	20-35
		12-60	Loam---------	CL	A-6	100	95-100	95-100	85-95	55-65
VbA, VbB-----------------	5+	0-60	Loam---------	CL	A-6	100	100	95-100	85-95	55-65
VcA----------------------	5+	0-12	Clay loam----	CL	A-6	100	100	95-100	90-100	65-75
		12-60	Loam---------	CL	A-6	100	100	95-100	85-95	55-65
Vista: VsD2, VsE, VsE2, VsF, VsF2.	2-3½	0-32	Coarse sandy loam or sandy loam.	SM	A-2	100	95-100	85-95	60-70	20-30
		32	Hard granitic rock.							

See footnote at end of table.

Atterberg values		Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
Liquid limit	Plastic index								
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------	(1/)	0.63-2.00	0.11-0.13	6.1-7.3	0-2	Low-------	Low--------	40	Moderate.
15-30	5-15	0.63-2.00	0.15-0.17	6.6-7.3	0-2	Low-------	Low---------	40	Moderate.
------	(1/)	2.00-6.30	0.06-0.07	7.3-8.4	0-2	Low-------	Low--------	25	Severe.
------	(1/)	0.63-2.00	0.11-0.13	9.0+	4-8	Low-------	High-------	40	Moderate.
------	(1/)	2.00-6.30	0.10-0.12	8.5-9.0+	4-8	Low-------	High-------	40	Moderate.
------	(1/)	0.63-2.00	0.10-0.15	8.4-9.0+	2-8	Low-------	High-------	40	Moderate.
------	(1/)	2.00-6.30	0.10-0.12	8.4-9.0+	4-16+	Low-------	High-------	40	Moderate.
------	(1/)	2.00-6.30	0.11-0.13	6.6-7.3	0-2	Low-------	Low--------	40	Moderate.
25-30	10-15	0.63-2.00	0.15-0.17	7.4-8.4	0-2	Low-------	Low--------	40	Moderate.
25-30	10-15	0.63-2.00	0.15-0.17	6.6-8.4	0-2	Low-------	Low--------	40	Moderate.
15-30	5-15	0.20-0.63	0.18-0.20	6.6-7.3	0-2	Moderate--	Moderate---	40	Moderate.
25-30	10-15	0.63-2.00	0.15-0.17	7.4-8.4	0-2	Low-------	Low--------	40	Moderate.
------	(1/)	2.00-6.30	0.10-0.12	6.1-7.3	0-2	Low-------	Low--------	40	Moderate.

Soil series and map symbols	Depth to bedrock	Depth from surface (typical profile)	Classification			Percentage passing sieve--				
			Dominant USDA texture	Unified	AASHO	Larger than 3 inches	No. 4	No. 10	No. 40	No. 200
	Feet	Inches								
Wyman:										
WgC, WgD----------------	5+	0-10	Gravelly loam.	SM or SC	A-2	100	80-95	75-85	60-65	30-35
		10-55	Gravelly clay loam.	SM or SC	A-2	100	75-85	70-80	50-55	30-35
		55-61	Gravelly sandy loam.	GP or SP	A-1	95-100	60-90	45-65	25-45	10-20
WoC---------------------	5+	0-12	Cobbly loam-	ML	A-4	65-80	65-85	65-85	55-75	30-35
		12-50	Gravelly clay loam.	SM or SC	A-2	100	75-85	70-75	50-55	30-35
		50-60	Gravelly sandy loam.	GP or SP	A-1	95-100	60-90	45-65	25-45	10-20
Yolo: YoA, YoC----------	5+	0-72	Loam--------	ML or CL	A-4 or A-6	100	100	95-100	85-100	70-90
Zamora:										
ZaC, ZaD----------------	5+	0-16	Loam--------	ML	A-4	100	95-100	90-95	85-95	55-70
		16-35	Clay loam---	CL	A-6	100	95-100	90-100	90-100	55-70
		35-84	Loam and a few pebbles.	ML	A-4	100	95-100	90-100	90-100	85-95
ZcC---------------------	5+	0-36	Clay loam---	CL	A-6	100	95-100	90-100	90-100	55-70
		36-60	Loam and a few pebbles.	ML	A-4	100	95-100	90-100	85-95	55-70

1/ Nonplastic.

Atterberg values: Liquid limit	Atterberg values: Plastic index	Permeability	Available water capacity	Reaction	Salinity	Shrink-swell potential	Corrosivity (uncoated steel)	Sanitary absorption capacity	Allowable soil pressure
		Inches per hour	Inches per inch of soil	pH value	Mmhos/cm. at 25° C.			Sq. ft. per 100 gal.	
------	(1/)	0.63-2.00	0.10-0.12	6.1-7.3	0-2	Low------	Low-------	40	Moderate.
20-30	5-15	0.63-2.00	0.14-0.16	6.6-7.3	0-2	Low------	Low-------	40	Moderate.
------	(1/)	2.00-6.30	0.08-0.10	6.6-7.3	0-2	Low------	Low-------	40	Moderate.
------	(1/)	0.63-2.00	0.08-0.11	6.1-7.3	0-2	Low------	Low-------	40	Moderate.
20-30	5-15	0.63-2.00	0.16-0.17	6.1-7.3	0-2	Low------	Low-------	40	Moderate.
------	(1/)	2.00-6.30	0.08-0.09	6.6-7.3	0-2	Low------	Low-------	40	Moderate.
30-40	5-15	0.63-2.00	0.15-0.17	5.6-7.3	0-2	Moderate-	Low-------	40	Moderate.
------	(1/)	0.63-2.00	0.16-0.18	6.1-6.5	0-2	Moderate-	Low-------	40	Moderate.
20-30	5-15	0.20-0.63	0.18-0.20	6.1-7.3	0-2	Moderate-	Moderate--	40	Moderate.
------	(1/)	0.63-2.00	0.16-0.18	7.3-8.4	0-2	Moderate-	Low-------	40	Moderate.
20-30	5-15	0.20-0.63	0.18-0.20	6.1-7.3	0-2	Moderate-	Moderate--	40	Moderate.
------	(1/)	0.63-2.00	0.16-0.18	6.1-7.3	0-2	Moderate-	Low-------	40	Moderate.

TABLE 7.--ENGINEERING

[Not included in this table, because their characteristics are
Riverwash (Rg), Rock land (RhF), Rough broken land

Soil series and map symbols	Suitability as source of--		
	Topsoil	Sand and gravel	Road fill
Adelanto: AaB, AcA, AdB------------	Poor: Low fertility-	Poor for sand, excessive fines; mapping units AaB and AcA unsuitable for gravel, and unit AdB poor for gravel.	Good------------------
Agua Dulce: AgF-------------------	Poor: Stones present.	Poor for sand and unsuitable for gravel in the upper 20 inches, excessive fines; below a depth of 20 inches, good for sand, which is well graded, and fair for gravel.	Good------------------
Amargosa: AmF2--------------------	Poor: Depth to bedrock.	Unsuitable; granitic rock at a depth of 14 to 20 inches.	Good------------------
Anaverde: AnE, ApF----------------	Fair: Depth to bedrock.	Unsuitable; excessive fines; less than 25 percent is gravel.	Fair: A-4 or A-6; hard schist at a depth of 36 to 55 inches.
Arizo: AsB, AtA-------------------	Poor: Gravel and cobblestones present; low fertility.	Good; upper 24 inches of unit AtA unsuitable for gravel.	Good------------------
Ayar: AyD-------------------------	Poor: Low fertility clay texture.	Unsuitable; excessive fines.	Poor: A-7; high shrink-swell potential.
Balcom---------------------------- (Mapped only with Castaic soils.)	Fair: Weathered shale at a depth of 26 to 40 inches.	Unsuitable; excessive fines.	Fair to poor: A-7; moderate shrink-swell potential; weathered shale at a depth of 26 to 40 inches.

too variable for engineering use, are the land types Gullied land (GuF), (RzF), Sandy alluvial land (Sa), and Terrace escarpments (TsF)]

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Most features favorable.	Subject to piping and cracking; moderate strength.	Moderate permeability----	Most features favorable, but unit AdB is gravelly and requires more frequent irrigation.	B
Steep slopes; conglomerate at a depth of 36 to 60 inches.	Subject to piping and cracking.	Moderately slow permeability; steep slopes.	Unsuitable-----------	C
Slopes steep in places; granitic rock at a depth of about 14 to 20 inches.	Moderate strength and stability; subject to piping and cracking.	Moderately rapid permeability; hard granitic rock at a depth of 14 to 20 inches; steep slopes in places.	Unsuitable-----------	C
Slopes steep in places; hard schist rock at a depth of 36 to 55 inches.	Subject to cracking; moderate to low strength.	Moderate permeability; hard schist at a depth of 36 to 55 inches; steep slopes in places.	Unsuitable-----------	C
Most features favorable.	High strength----------	Very rapid permeability---	Unsuitable-----------	A
High shrink-swell potential.	Low strength; moderate stability.	Slow permeability---------	Unsuitable-----------	D
Soft shale at a depth of 26 to 40 inches.	Very low strength; variable stability.	Moderately slow permeability; weathered shale at a depth of 26 to 44 inches; steep slopes in some places.	Slow intake rate; moderate water-holding capacity; steep slopes in some places.	C

Soil series and map symbols	Suitability as source of--		
	Topsoil	Sand and gravel	Road fill
Cajon:			
CaA, CaC, CcA2, CcD2--------------	Poor: Low fertility; sandy.	Good for sand; unsuitable for gravel; less than 25 percent is gravel.	Good-------------------
CbA-------------------------------	Poor: Low fertility; sandy to a depth of 30 to 40 inches.	Good for sand in the upper 30 to 40 inches and poor below, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good in upper 30 to 40 inches, but fair below: A-4.
Calvista: ChC, ChE----------------- (For interpretations of Hi Vista soils in these mapping units, refer to Hi Vista series in this table.)	Poor: Depth to bedrock.	Unsuitable; granitic rock at a depth of 15 to 18 inches.	Good-------------------
Castaic:			
CkC, CkD, CmD, CmE, CmF, CmF2, CmG2. (For interpretations of Balcom soils in mapping units CmD through CmG2, refer to Balcom series in this table.)	Fair: Weathered shale at a depth of 26 to 40 inches.	Unsuitable; excessive fines.	Fair to poor: A-7; moderate shrink-swell potential; depth to weathered shale is 26 to 40 inches.
CnG3------------------------------ (For interpretations of Saugus soils in this mapping unit, refer to Saugus series in this table.)	Poor: Topsoil is less than 20 inches thick.	Unsuitable; excessive fines.	Fair to poor: A-7; weathered shale is at a depth of 20 to 30 inches.
Chino: Co--------------------------	Poor: Slightly to moderately saline-alkali.	Unsuitable; excessive fines.	Fair: A-6-------------
Cortina:			
CyA, CyC--------------------------	Poor: Topsoil is less than 20 inches thick.	Poor for sand in the upper 20 inches, because of excessive fines, but good below; fair to poor for gravel; cobblestones in some places.	Good-------------------
CzC-------------------------------	Poor: Cobblestones-	Good for sand; fair to poor for gravel; cobblestones in some places.	Good-------------------

Soil features affecting--					Hydrologic soil group
Road location	Water retention		Irrigation		
	Embankments	Reservoir area			
Most features favorable.	Subject to seepage in some places.	Rapid permeability-----	Low water-holding capacity; rapid intake rate.		A
Most features favorable.	Slight to medium strength; subject to piping and cracking.	Rapid permeability to a depth of 30 to 40 inches, but moderately permeable below.	Moderate water-holding capacity; rapid intake rate.		A
Granitic rock at a depth of 15 to 18 inches.	Moderate strength and stability; subject to piping and cracking.	Moderately rapid permeability; granitic rock at a depth of 15 to 18 inches; steep slopes in some places.	Unsuitable-----------		C
Soft shale at a depth of 26 to 40 inches.	Very low strength; variable stability.	Moderately slow permeability; weathered shale at a depth of 26 to 44 inches; steep slopes in some places.	Slow intake rate; moderate water-holding capacity; steep slopes in some places.		C
Steep slopes; weathered shale at a depth of 20 to 30 inches.	Very low strength; variable stability.	Moderately slow permeability; weathered shale at a depth of 20 to 30 inches; steep slopes.	Unsuitable-----------		C
Seasonal water table below a depth of 36 inches.	Very low strength; variable stability; subject to piping and cracking.	Moderately slow permeability.	Most features favorable; drainage required.		C
Most features favorable.	Low strength and stability.	Rapid permeability; very cobbly and gravelly below a depth of 20 inches.	Low water-holding capacity; moderately rapid intake rate.		A
Contains many cobblestones.	Contains cobblestones; very pervious.	Rapid permeability; cobbly throughout.	Very low water-holding capacity; very rapid intake rate.		A

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Soil series and map symbols	Suitability as source of-- Topsoil	Sand and gravel	Road fill
Dune land: DuD--------------------	Poor: Very low fertility; sandy.	Good for sand; unsuitable for gravel; less than 25 percent is gravel.	Good-------------------
Gaviota: GaE2, GaF2---------------	Poor: Sandstone is at a depth of 14 to 20 inches; rocks crop out.	Unsuitable; hard bedrock at a depth of 14 to 20 inches.	Good: Bedrock at a depth of 14 to 20 inches.
Gazos: GbF------------------------	Fair: Shale at a depth of 20 to 40 inches.	Unsuitable; excessive fines; hard shale is at a depth of 20 to 40 inches.	Fair in upper 20 to 40 inches: A-4 or A-6; bedrock at a depth of 20 to 40 inches.
Godde: GcE, GdF-------------------	Poor: Schist at a depth of 14 to 20 inches; rocks crop out.	Unsuitable; bedrock at a depth of 14 to 20 inches.	Fair in upper 14 to 20 inches: A-4 or A-6; bedrock at a depth of 14 to 20 inches.
Gorman: GoD, GoD2, GoE2, GoF2-----	Fair: Sandy loam--	Poor for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good-------------------
Greenfield: GsA, GsC, GsC2, GsD2--	Fair: Sandy loam--	Poor for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good-------------------
Hanford:			
HaB2, HbA, HbC, HbD--------------	Fair: Loamy sand and coarse sandy loam.	Fair to poor for sand, 25 to 35 percent is fines; unsuitable for gravel, less than 25 percent is gravel.	Good-------------------
HcA, HcC, HeC, HfA---------------	Good----------------	Poor for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good-------------------
HdC------------------------------	Poor: Gravel present.	Fair for sand, 10 to 20 percent is fines; poor for gravel, 10 to 40 percent is gravel.	Good------------------

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Steep slopes in some places; subject to deposition by wind erosion.	Low strength; very high shear strength.	Very rapid permeability; seepage control required.	Unsuitable--------	A
Steep slopes; hard sandstone at a depth of 14 to 20 inches.	Moderate strength and stability; subject to piping and cracking.	Moderately rapid permeability; hard sandstone at a depth of 14 to 20 inches; steep slopes in places.	Unsuitable--------	D
Steep slopes; shattered shale at a depth of 20 to 40 inches; high in organic matter.	Moderate strength; variable stability; subject to cracking and piping.	Moderately slow permeability; shattered shale at a depth of 20 to 40 inches; steep slopes.	Moderate water-holding capacity; steep slopes; moderate soil depth.	C
Steep slopes in places; hard schist at a depth of 14 to 20 inches.	Subject to piping and cracking; moderate strength.	Moderate permeability; schist is at a depth of 14 to 20 inches; steep slopes.	Unsuitable--------	D
Steep slopes in some places.	Moderate strength; variable stability; subject to piping and cracking.	Moderately slow permeability; steep slopes in some places.	High water-holding capacity; steep slopes in some places.	C
Most features favorable.	Low strength; variable stability; subject to piping and cracking.	Moderately rapid permeability.	High water-holding capacity; moderately rapid permeability.	B
Most features favorable.	Low stability; subject to piping and cracking.	Moderately rapid permeability.	Moderate water-holding capacity; moderately rapid permeability.	A
Most features favorable.	Low stability; subject to piping and cracking.	Moderately rapid to moderate permeability.	Moderate to high water-holding capacity; moderately rapid to moderate permeability.	B
Most features favorable.	Subject to piping and cracking; moderate strength.	Moderately rapid permeability; gravelly throughout.	Moderate available water holding capacity; moderately rapid permeability.	A

Soil series and map symbols	Suitability as source of-- Topsoil	Sand and gravel	Road fill
Hesperia: HgA, HgA2, HgB, HkA, HkB, HmA, HnA.	Good to fair: Loamy sand in some places.	Fair for sand in the upper 8 to 10 inches, and poor below because of excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good------------------
Hi Vista-------------------------- (Mapped only with Calvista soils.)	Fair: Sandy clay loam; granitic rock at a depth of 25 to 36 inches.	Poor for sand in the upper 25 to 36 inches, excessive fines; unsuitable for gravel, less than 25 percent is gravel; granitic rock at a depth of 25 to 36 inches.	Fair: Moderate shrink-swell potential; granitic rock at a depth of 25 to 36 inches.
Las Posas: LaE, LdF--------------- (For interpretations of Toomes soils in mapping unit LdF, refer to Toomes series in this table.)	Poor: Clay texture; basalt at a depth of 24 to 32 inches.	Unsuitable; excessive fines; bedrock at a depth of 24 to 32 inches.	Fair in upper 24 inches: A-6 and A-7; bedrock at a depth of about 24 to 32 inches inches.
Lebec: LeF------------------------	Fair: Bedrock at a depth of 24 to 48 inches; loam.	Unsuitable; excessive fines; bedrock at a depth of 24 to 48 inches.	Good in upper 30 to 48 inches: Bedrock at a depth of 24 to 48 inches.
Merrill: Me-----------------------	Poor: Slightly to moderately saline-alkali.	Unsuitable; excessive fines; less than 25 percent is gravel.	Good to fair: A-2, A-6; hardpan at a depth of 23 to 40 inches.
Metz:			
MfA, MfC------------------------	Poor: Low fertility; sandy texture.	Good for sand; unsuitable for gravel, less than 25 percent is gravel.	Good------------------
MgA, MgB------------------------	Poor: Sandy texture.	Unsuitable for sand in the upper 8 to 16 inches because of excessive fines, other layers good; unsuitable for gravel, less than 25 percent is gravel.	Fair in upper 8 to 16 inches: A-4; good in other layers.

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Most features favorable.	Moderate strength; subject to piping and cracking; variable stability.	Moderately rapid permeability.	Moderate available water holding capacity; moderately rapid permeability.	B
Granitic rock at a depth of 25 to 36 inches.	Moderate strength; variable stability; subject to cracking.	Moderately slow permeability; granitic rock below a depth of 25 to 36 inches; steep slopes in some places.	Unsuitable--------	B
Steep slopes in some places; hard basalt and tuff at a depth of 24 to 32 inches.	Moderate strength; variable stability; subject to piping and cracking.	Moderately slow permeability; hard basalt and tuff at a depth of 24 to 32 inches; steep slopes in places.	Moderate water-holding capacity; steep slopes in some places; moderately slow permeability.	C
Steep slopes in places; limestone at a depth of 24 to 48 inches.	Moderate strength; variable stability; subject to piping and cracking.	Moderate permeability; limestone at a depth of 24 to 48 inches; steep slopes in places.	Unsuitable---------	B
Hardpan at a depth of 23 to 40 inches.	Moderate strength; subject to piping and cracking.	Moderately slow permeability; hardpan at a depth of 23 to 40 inches.	Moderate water-holding capacity; moderately slow permeability; hardpan at a depth of 23 to 40 inches.	C
Most features favorable.	Variable strength and stability; subject to piping and cracking.	Rapid permeability------	Low water-holding capacity; rapid permeability.	A
Most features favorable.	Variable strength and stability; surface soil subject to piping and cracking.	Rapid permeability------	Moderate water-holding capacity; rapid permeability.	B

Soil series and map symbols	Suitability as source of--		
	Topsoil	Sand and gravel	Road fill
Millsholm: MhE2, MhF2---------------	Poor: Rock at a depth of 14 to 20 inches.	Unsuitable; bedrock at a depth of 14 to 20 inches.	Fair in upper 14 to 20 inches: A-4; bedrock at a depth of 14 to 20 inches.
Mocho: MoA, MpA, MpC----------------	Good----------------	Unsuitable; excessive fines.	Fair: A-4 or A-6-----
Mohave: MzB------------------------	Fair: Sandy clay loam subsoil.	Unsuitable; excessive fines.	Good to fair: A-2 and A-6.
Oakdale: OaC-----------------------	Good----------------	Poor for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good-----------------
Oak Glen:			
ObA, ObC--------------------------	Good----------------	Poor for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good-----------------
OcC-------------------------------	Fair: Gravel in some places.	Fair to poor for sand, 10 to 25 percent fines; poor for gravel, 15 to 35 percent is gravel.	Good-----------------
OdA, OdC--------------------------	Good----------------	Unsuitable; excessive fines.	Fair: A-4------------
Oban-------------------------------- (Mapped only with Pond soils.)	Poor: Moderately to severely saline-alkali.	Unsuitable in upper 22 to 36 inches, excessive fines; poor to fair below.	Fair to good: A-4 and A-6.

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Steep slopes in places; hard sandstone and shale at a depth of 14 to 20 inches.	Moderate strength; variable stability; subject to piping and cracking.	Moderate permeability; hard sandstone and shale at a depth of 14 to 20 inches; steep slopes in places.	Unsuitable-------	D
Most features favorable.	Moderate strength; variable stability; subject to piping and cracking.	Moderate permeability----	High water-holding capacity; moderate permeability.	B
Most features favorable.	Low strength; variable stability; subject to piping and cracking.	Moderately slow permeability in subsoil.	High water-holding capacity; moderately slow permeability.	C
Most features favorable.	Moderate strength; variable stability; subject to piping and cracking.	Moderate permeability----	High water-holding capacity; moderate permeability.	B
Most features favorable.	Moderate strength; variable stability; subject to piping and cracking.	Moderately rapid permeability.	Moderate water-holding capacity; moderately rapid permeability.	B
Most features favorable.	Moderate strength; variable stability; subject to piping and cracking.	Moderately rapid permeability; control of seepage needed.	Moderate water-holding capacity; moderately rapid permeability.	B
Most features favorable.	Low strength; variable stability; subject to piping and cracking.	Moderate permeability----	High water-holding capacity; moderate permeability.	B
Most features favorable; high shrink-swell potential.	Low to moderate strength; variable stability; subject to piping and cracking.	Slow permeability---------	High water-holding capacity; slow permeability.	C

Soil series and map symbols	Suitability as source of-- Topsoil	Sand and gravel	Road fill
Ojai: OgC, OgD, OgE, OgF, OgF2, OzE------ (For interpretations of Zamora soils in mapping unit OzE, refer to Zamora series in this table.)	Poor: Gravel in some places.	Poor for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Fair to good: A-2, A-4 or A-6.
Ojai, thin surface variant: OhF-------------------------------	Poor: Gravel in some places.	Poor for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Fair to good: A-1, A-4, A-6 or A-7.
Pond: Po, Ps, Px-------------------- (For interpretations of Oban soils in mapping unit Px, refer to Oban series in this table.)	Poor: Moderately to severely saline-alkali.	Generally unsuitable for sand and gravel; excessive fines; some gravelly strata in places below a depth of about 40 inches.	Poor: A-7-----------
Ramona: RcA, RcB, RcC, RcD, RdE2-----------	Fair: Sandy loam and sandy clay loam.	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good in the upper 12 to 22 inches, fair in the other layers: A-2, A-4 and A-6.
ReC, ReE--------------------------	Poor: Gravelly sandy loam.	Unsuitable for sand, excessive fines; poor for gravel, less than 25 percent is gravel.	Good----------------
RfB, RfC--------------------------	Fair: Loam and sandy clay loam.	Unsuitable; excessive fines; less than 25 percent is sand and gravel.	Fair: A-4 and A-6---

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Steep slopes in some places.	Variable strength and stability; subject to piping and cracking.	Moderately slow permeability above the substratum and moderately rapid permeability in the substratum; steep slopes in some places.	High water-holding capacity; moderately slow permeability; steep slopes in places.	C
Steep slopes----------	Moderate strength; variable stability; subject to piping and cracking.	Moderately slow permeability.	Unsuitable--------	C
High shrink-swell potential.	Low to moderate strength; variable stability; subject to piping and cracking.	Moderately slow permeability.	High water-holding capacity; moderately slow permeability.	C
Steep slopes in some places.	Low strength and stability; subject to piping and cracking.	Moderately slow permeability in subsoil; moderately rapid to rapid permeability in substratum.	High water-holding capacity; steep slopes in some places; moderately slow permeability.	C
Steep slopes in some places.	Moderate strength; low stability.	Moderately slow permeability; some fine gravel throughout profile; steep slopes in some places.	High water-holding capacity; moderately slow permeability; steep slopes in some places.	C
Most features favorable.	Low strength and low stability; subject to piping and cracking.	Moderately slow permeability in subsoil.	High water-holding capacity; moderately slow permeability.	C

Soil series and map symbols	Suitability as source of--		
	Topsoil	Sand and gravel	Road fill
Rosamond:			
Rm, Rm2------------------------------	Poor: Sandy surface soil; slightly saline-alkali.	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good to fair: A-2 and A-4.
Ro, Rp-------------------------------	Poor: Slightly and moderately saline-alkali.	Unsuitable; excessive fines.	Fair to good: A-2 and A-4.
Rr, Ru-------------------------------	Poor: Slightly to moderately saline-alkali.	Unsuitable; excessive fines.	Fair to good: A-2 and A-4.
Rs-----------------------------------	Poor: Slightly saline-alkali.	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Fair to good: A-4 and A-2.
Rt-----------------------------------	Poor: None to moderately saline-alkali.	Unsuitable; excessive fines.	Fair: A-4----------
Saugus: ScE, ScF, ScF2---------------	Poor: Weakly consolidated sediment at a depth of 34 to 56 inches.	Unsuitable in the upper 34 to 56 inches; excessive fines, poor in other layers; strata of sand and gravel in some places.	Good----------------
Sheridan: ShE, ShE2, ShF, ShF2--------	Poor: Granitic rock at a depth of 24 to 36 inches; rock crops out in some places.	Poor for sand in the upper 24 to 36 inches, 15 to 25 percent fines; poor for gravel, less than 40 percent is gravel.	Good----------------
Soboba: SoB--------------------------	Poor: Low fertility; cobblestones.	Good for sand; fair for gravel; material variable in size and includes some cobblestones.	Good----------------
Sorrento: SsA, SsB-------------------	Good----------------	Unsuitable for sand and gravel; excessive fines.	Fair: A-4----------

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Most features favorable.	Variable strength; moderate to low stability; subject to piping and cracking.	Moderate permeability---	High water-holding capacity; moderate permeability.	C
Most features favorable.	Variable strength; low stability; subject to piping and cracking.	Moderate permeability---	High water-holding capacity; moderate permeability.	C
Most features favorable.	Variable strength; low stability.	Moderate permeability---	High water-holding capacity; moderate permeability.	C
Most features favorable.	Variable strength; low stability; subject to piping and cracking.	Moderate permeability---	High water-holding capacity; moderate permeability.	C
Most features favorable.	Moderate strength; moderate to low stability; subject to piping and cracking.	Moderate permeability---	High water-holding capacity; moderate permeability.	C
Steep slopes in some places; weakly consolidated sediment at a depth of 34 to 56 inches.	Moderate strength; variable stability; subject to piping and cracking.	Moderate permeability; weakly consolidated materials at a depth of 34 to 56 inches; steep slopes in places.	Moderate water-holding capacity; steep slopes in some places; moderate permeability.	B
Steep slopes; granitic rock at a depth of 24 to 36 inches.	Low to moderate strength; variable stability; subject to piping and cracking.	Moderately rapid permeability; steep slopes.	Unsuitable---------	B
Most features favorable.	High strength and stability.	Very rapid permeability--	Unsuitable---------	A
Most features favorable.	Low strength and stability; subject to piping and cracking.	Moderate permeability---	Very high water-holding capacity; moderate permeability.	B

Soil series and map symbols	Suitability as source of-- Topsoil	Sand and gravel	Road fill
Sunrise:			
Su, Sv	Poor: Low fertility; strongly alkaline.	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good to fair: A-2 and A-4; hardpan at a depth of 24 to 39 inches.
Sw	Poor: Hardpan at a depth of 10 to 15 inches.	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good to fair: A-2 and A-4; hardpan at a depth of 10 to 15 inches.
Sx, Sy	Poor: Slightly to moderately saline-alkali.	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 15 percent is gravel.	Good to fair: A-4; hardpan at a depth of 24 to 39 inches.
Temescal: TrF	Poor: Andesite at a depth of 14 to 20 inches.	Unsuitable for sand, excessive fines; bedrock at a depth of 14 to 20 inches; unsuitable for gravel; less than 25 percent is gravel.	Good in the upper 14 to 20 inches: A-2; bedrock at a depth of 14 to 20 inches.
Toomes (Mapped only with Las Posas soils.)	Poor: Basalt at a depth of 12 to 18 inches.	Unsuitable for sand and gravel; excessive fines; bedrock at a depth of 12 to 18 inches.	Fair in the upper 12 to 18 inches: A-4; bedrock at a depth of 12 to 18 inches.
Tray:			
Tt2	Poor: Low fertility; sandy surface soil; slightly to moderately saline-alkali.	Good for sand in the upper 18 to 36 inches, but poor in the lower layers, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good
Tu, Tv, Tw	Poor: Slightly to strongly saline-alkali.	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 25 percent is gravel.	Good

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Hardpan at a depth of 24 to 39 inches.	Low to moderate strength and stability; subject to piping and cracking.	Moderately slow permeability.	Moderate water-holding capacity; moderately slow permeability; hardpan at a depth of 24 to 39 inches.	C
Hardpan at a depth of 10 to 15 inches.	Low to moderate strength; low stability; subject to piping and cracking.	Moderately slow permeability.	Low water-holding capacity; moderately slow permeability; hardpan at a depth of 10 to 15 inches.	C
Most features favorable; hardpan at a depth of 24 to 39 inches.	Low strength; moderate to low stability; subject to piping and cracking.	Moderately slow permeability.	Moderate water-holding capacity; moderately slow permeability; hardpan at a depth of 24 to 39 inches; saline-alkali.	C
Steep slopes; hard andesite at a deptn of 14 to 20 inches.	Moderate strength; variable stability; subject to piping and cracking.	Moderate permeability; hard andesite at a depth of 14 to 20 inches; steep slopes.	Unsuitable------------	C
Steep slopes; hard basalt is at a depth of 12 to 18 inches.	Moderate strength; variable stability; subject to piping and cracking.	Moderate permeability; hard basalt at a depth of 12 to 18 inches; steep slopes.	Unsuitable------------	D
Most features favorable.	Variable strength; moderate to low stability; lower layers subject to piping and cracking.	Moderate permeability.	Moderate water-holding capacity; surface needs smoothing; moderate permeability.	C
Most features favorable.	Variable strength; moderate to low stability; subject to piping and cracking.	Moderate permeability.	Moderate permeability; leaching needed.	C

Soil series and map symbols	Suitability as source of--		
	Topsoil	Sand and gravel	Road fill
Vernalis: VaA, VbA, VbB, VcA----------	Good-----------------	Unsuitable for sand and gravel; excessive fines.	Fair: A-2 and A-6.
Vista: VsD2, VsE, VsE2, VsF, VsF2-----	Fair: Grantitic rock at a depth of 28 to 38 inches.	Poor for sand in the upper 28 to 38 inches, 20 to 30 percent fines; unsuitable for gravel, less than 15 percent is gravel.	Good---------------
Wyman:			
WgC, WgD-----------------------------	Fair: Gravelly------	Unsuitable for sand, excessive fines; unsuitable for gravel, less than 40 percent is gravel.	Good--------------
WoC----------------------------------	Poor: Cobblestones--	Unsuitable for sand, excessive fines; poor for gravel, some cobblestones.	Good--------------
Yolo: YoA, YoC------------------------	Good-----------------	Unsuitable for sand and gravel; excessive fines.	Fair: A-4 or A-6--
Zamora: ZaC, ZaD, ZcC-----------------	Good to fair: Clay loam subsoil.	Unsuitable for sand and gravel; excessive fines.	Fair: A-4 or A-6--

Soil features affecting--				Hydrologic soil group
Road location	Water retention		Irrigation	
	Embankments	Reservoir area		
Most features favorable.	Low to moderate strength; variable stability; subject to piping and cracking.	Moderate to moderately slow permeability.	High water-holding capacity; moderate to moderately slow permeability.	B
Steep slopes in places; hard granitic rock at a depth of 28 to 38 inches.	Moderate strength and stability; subject to piping and cracking.	Moderately rapid permeability; granitic rock at a depth of 28 to 38 inches; steep slopes in places.	Low water-holding capacity; steep slopes in places; moderately rapid permeability.	B
Most features favorable.	Moderate strength; subject to piping and cracking; variable stability.	Moderate permeability; some fine pebbles throughout.	High water-holding capacity; moderate permeability.	B
Contains many cobblestones.	Low to moderate strength; subject to piping and cracking; variable stability.	Moderate permeability; cobbly throughout.	Moderate water-holding capacity; moderate permeability.	B
Most features favorable.	Low strength; variable stability; subject to piping and cracking.	Moderate permeability.	Very high water-holding capacity; moderate permeability.	B
Most features favorable.	Low strength; variable stability; subject to piping and cracking.	Moderately slow permeability; moderate permeability in lower part.	Very high water-holding capacity; moderately slow permeability.	C

FORMATION, MORPHOLOGY, AND CLASSIFICATION OF SOILS

In this section the factors that affect the formation of the soils in the Antelope Valley Area are discussed and important processes in the morphology of the soils are described. Then the classification of the soils by higher categories is given.

Formation of Soils

Soil is a natural body on the surface of the earth in which plants grow; it is composed of organic and mineral material. Soils differ in their appearance, composition, productivity, and management requirements in different localities or even within short distances in the same locality. The factors that cause soils to differ are (1) the physical and chemical composition of the parent material; (2) the climate under which the soil material has accumulated and existed since accumulation; (3) the biological forces; (4) the relief, or lay of the land, and (5) the length of time the forces of formation have acted on the soil material. The relative importance of each factor differs from place to place, but generally the interaction of all the factors determines the kind of soil that forms in any given place.

Generally, the total changes in soils take place gradually over a fairly long time. Newly added material tends to make up for losses of material, and in many areas a balance between the two develops. Over a long period, therefore, net changes in the soil under natural conditions may be only minor.

Each soil-forming factor includes many variables that affect the character of the soil and tend to modify the effectiveness of the other factors. Many of the soils near Lancaster, for example, have similar parent materials and formed under the same climate. These soils have striking profile differences, however, because of the relief factor.

The influence of each soil-forming factor on the soils in the Antelope Valley Survey Area are summarized in the pages that follow.

Parent Material

Parent material is the weathered rock or unconsolidated mass from which soils form. It is largely responsible for the chemical and mineralogical composition of soils. In the Antelope Valley Area, the soils formed in residual and alluvial materials. Soils derived from residual materials formed in place through weathering of the underlying rocks. Many of these are on sedimentary rocks in the southwestern part of the Area. Soils formed in alluvial material are in the Antelope Valley and the Mojave Desert.

A knowledge of the geology of the survey area is useful in understanding the relationship of parent material to formation of the soils. The San Andreas Rift Zone and tributary faults, such as the Garlock, dissect the Area. These have contributed to the complexity of the parent rocks. Further detail about the geology of the survey area can be obtained from material published by the California Division of Mines (5).

Most of the soils in the survey area formed in unconsolidated alluvium. In the northern part, the soils formed largely from granitic alluvium that contained small amounts of schistose rock or other kinds of rock. Soils of the Adelanto, Arizo, Cajon, Greenfield, Hanford, Hesperia, Oak Glen, Pond, Rosamond, Soboba, Sunrise, and Tray series are important soils that formed in granitic alluvium. The soils of the Gorman, Mohave, Oakdale, and Ramona series formed on terraces in granitic alluvium of Pleistocene time.

Soils that formed in sedimentary alluvium are in the Cortina, Mocho, Metz, Sorrento, Yolo, and Zamora series.

Alluvium derived largely from basic rock is the parent material of the Wyman soils. These soils typically are neutral below a depth of 2 or 3 inches.

Many of the soils in the survey area formed in place in material weathered from hard, acid, igneous rock, such as granite, granodiorite, and quartz-monzonite. Soils formed in material weathered from such rocks are on foothills and mountains in the middle, northeastern, and northwestern parts of the survey area. They are in the Amargosa, Calvista, Hi Vista, Sheridan, and Vista series. These soils range from 14 to more than 36 inches deep. They have a sandy loam surface layer and contain many angular particles of quartz.

Volcanic rock, such as andesite and basalt that in many places are interbedded with lenses of tuff, make up the parent materials of the Las Posas, Temescal, and Toomes soils. An example of the influence of parent rock on certain soil characteristics is provided by the parent materials of the Las Posas and Temescal soils. Temescal soils, which are shallow over andesite, typically are slightly acid. The moderately deep Las Posas soils, however, are on basaltic material. Their parent material is less acid than that of the Temescal soils, and they therefore are more alkaline.

Lebec soils formed in material weathered from limestone, and as a result, they contain large amounts of lime. The Merrill and Sunrise soils are other soils that reflect the influence of calcium carbonate parent materials.

Other soils formed in place are those of the Balcom, Castaic, Gaviota, Millsholm, and Saugus series, which are on sedimentary rock. Here the hardness of the rock is important in the rate of weathering of the rock. The Gaviota and Millsholm soils, for example, formed in material from hard, fine-grained sandstone and shale. These soils are shallow. In contrast, the deeper Balcom, Castaic, and Saugus soils formed in material from soft sandstone and shale.

Marine and nonmarine sedimentary rock formations make up the parent materials of the Agua Dulce and

Ojai series. These rocks are weakly consolidated and contain many rounded pebbles and cobblestones of mixed origin. Agua Dulce soils are stony and have large amounts of pebbles and cobblestones below the surface layer. Ojai soils, however, do not contain large amounts of pebbles and cobblestones.

Pelona schist is the parent material of the Anaverde soils. These soils have a surface layer of loam.

Climate

Climate has a strong influence on soil formation. Heat and moisture greatly influence the kind of vegetation that grows and the rate at which organic matter decomposes and at which minerals weather. They also influence the removal of material from the soil horizons or the accumulation of material in them.

Part of the survey area has an arid desert climate, and part has a Mediterranean climate that has hot, dry summers and cool, wet winters. Rainfall ranges from about 4 inches a year in the northeastern part, near Hi Vista, to as much as 20 inches in the Tehachapi Mountains at higher elevations.

At about the center of the Mojave Desert area, near Lancaster, annual precipitation is about 8 inches or less. Thunderstorms and accompanying showers are common. Runoff is rapid, however, and little water enters the soil. All soils formed in the desert have one characteristic in common; that is, leaching of carbonates and soluble salts is insufficient to remove enough salts and alkali to permit growth of many plants. Lime carbonates occur in all of the soils, and some of them contain slight to large amounts of salts and alkali. Also, the surface layer of all desert soils is low in organic matter. This is because sufficient vegetation is lacking in these arid areas. Also, summer temperatures are high and moisture is lacking.

In the middle and southeastern parts of the survey area, summers are hot and dry and winters are cool and moist. Enough rain falls that most free carbonates have been leached from the soils or have been moved to the lower part of the profile. Leaching is not sufficient, however, to remove much of the exchangeable bases held by the soils. This area is a transitional zone between the desert and forest (7). Typical soils are those in the Greenfield, Hanford, and Ramona series. These soils formed under chaparral (Southern California brush) or grasses and oaks. Movement and accumulation of clay generally is more rapid than where less rain falls. The A1 horizon is darker than that of soils in the desert. The content of organic matter is low, however, and the surface layer generally is hard and massive when dry.

At high elevations, mainly in the northwestern part of the survey area, rainfall ranges from 16 to 20 inches. Winters are cold; snow falls frequently but does not last long. Summers are dry and a little cooler than elsewhere in the Area, and the growing season is shorter. More organic matter accumulates in the soils. As a result, the A horizon is dark colored, thick, and friable. The soils are in good tilth. Representative soils are in the Gorman, Lebec, Oak Glen, and Sheridan series.

Biological Forces

Among the biological forces in the Antelope Valley Area that affect the formation of soils, vegetation is dominant. Plants, animals, insects, bacteria, and other organisms also add organic matter to the soils. Their activity, however, in the cycle of transferring and returning nutrients to the surface soil depends chiefly upon the vegetation that grows on the soils.

The vegetation in the desert part of the survey area is mainly desert shrubs that have a thin understory of annual grasses and forbs. There are only scattered remnants of perennial grasses. Little humus is added to soils in this dry area. Typically, the soils here have a pale surface layer that is low in organic matter.

In higher areas on alluvial fans, terraces, and foothills, rainfall is somewhat greater than that in the desert. Here the vegetation is grasses and oaks or stands of chaparral that have a fairly dense understory of annual grasses and forbs. At high elevations, where rainfall ranges from 16 to 20 inches, growth of vegetation is much better. Consequently, more organic matter is added to the soils. The dominant vegetation at high elevations is grasses and oaks, though scrub oak and pines and grasses grow in dense stands on slopes that face north. Typical soils here have a dark-colored, friable surface layer. They are in the Gorman, Oak Glen, and Sheridan series.

Small animals, earthworms, insects, and micro-organisms also influence the formation of soils (16). They mix organic matter into the soil and help to break down the remains of plants. Small animals, such as rodents, burrow into the soil and thus mix the layers. Krotovinas, caused by the filling of tunnels made by burrowing animals in one horizon and filled with material from outside the horizon, are common in soils of the Greenfield, Hanford, Hesperia, Oakdale, and Vista series. Earthworms and other small invertebrates feed on the organic matter in the upper few inches. They slowly but continually mix the soil material and make the material more permeable to water. Bacteria, fungi, algae, actinomyces, and other micro-organisms hasten the weathering of rocks and the decomposition of organic matter.

Man has changed the soils in the Area through land leveling and smoothing for irrigation, by reshaping and grading, through cultivation, and through grazing by livestock. Of these, reshaping and grading of the Gaviota, Millsholm, Ojai, and Saugus soils has caused the greatest changes. Deep cuts and fills made after fieldwork was done have altered large acreages near the mouth of Sand Canyon. In many areas, and particularly in Antelope Valley, grades within border checks have been releveled. Areas that need leveling or land

smoothing are continually being brought under irrigation. As a result, the surface layer and subsoil texture is changed in many places. Irrigation has brought about other changes, for example, in structure, fertility, amount of organic matter added to the soils, as well as changes through leaching of bases and carbonates. It also has caused changes in climate because of added moisture.

Relief

Relief through its effect on drainage and the erosion or wearing away of the mountains and the filling of the valleys has had an important effect on soil formation in the Antelope Valley Area.

The direction of the slope also affects the kind of soil that develops. The Anaverde soils, for example, formed in material weathered from schist on slopes that face north. These soils have a thicker, darker colored, more friable surface layer and a deeper solum than Godde soils, which formed from similar material but on south-facing slopes.

In basin areas and in valley troughs, the soils are nearly level. Most of the rainfall therefore moves into the soil, or if adequate outlets are not available, the water accumulates and stands on the areas before it slowly drains away or evaporates. The soils in such areas are moderately well drained. They are in the Merrill, Oban, Pond, Sunrise, and Tray series. Of these, both the Merrill and Sunrise soils have a hard, lime-cemented Cca horizon, probably because of repeated saturation with water high in lime (6).

Low areas in the valley troughs are occupied by the Oban, Pond, and Tray soils. The content of salts and alkali in these soils is low to high. Development of the B horizon varies in accordance with differences in microrelief of the valley trough. Concave areas in the microrelief toposequence are occupied by Oban soils, and the somewhat higher areas on the valley floor, by Pond and Tray soils. As a result, Oban soils are subject to more ponding and leaching, have the most clay, and the most pronounced B2t horizon. In the Oban soils structure is strong columnar, content of sodium is high, and the percentage of clay is more than 35 percent.

In the higher areas on convex slopes, the soils are naturally better drained and are free of salts and alkali. Such soils are in the Adelanto, Arizo, Cajon, Mohave, and Rosamond series.

In the middle and southwestern parts of the survey area, drainage is better than in the other parts. Leona Valley is drained by Amargosa Creek. Here drainage generally is good. In places occupied by the Chino soils, however, drainage is somewhat poor because of local microrelief. The Santa Clara River and its major tributaries drain the southwestern part of the survey area. These streams flow through steep-sided, troughlike valleys. The streams have cut down to grade and have left a pattern of rugged convex relief that includes some striking remnants of terraces. Drainage on the alluvial fans, terraces, and upland hills of these areas is much better than elsewhere in the survey area, and air-water relationships also are better. Consequently, the lower part of soils that formed in these areas has stronger chroma and redder hue, such as brown, strong brown, or reddish brown. In these areas soils of the Agua Dulce and Ojai series have formed.

The nearly level to sloping Ojai soils are on terraces. These soils are in concave areas where water accumulates and percolates downward through the profile. Because of extra leaching and translocation of clay minerals as the result of water movement, the B2t horizon is well developed. This horizon consists of reddish-brown, slightly acid clay loam that has prismatic structure.

Soils that are poorly aerated during much of the period of their formation are nearly always mottled in the lower part with various shades of gray, yellow, and brown. Many are gray or gleyed throughout. The degree of mottling and the amount of gray color depend largely on the length of time the soil stays saturated each year. Examples are the nearly level Chino soils. These soils occupy nearly closed areas along fault zones and sagponds, chiefly in Leona Valley. Rainfall here is higher than in other valleys, and drainage is somewhat poor. Chino soils have a thick, dark-colored surface layer, have mottled horizons of high chroma, and contain salts, alkali, and gypsum. They are calcareous throughout. Saltgrass, wiregrass, sedges, and other plants that grow well in wet areas make up the vegetation.

Time

A long time usually is required for a soil to form. The age of any one soil is directly related to the action and interaction of the soil-forming factors. In general, the degree of development or differentiation between horizons within the soil is related to the age of a soil. For this reason, a soil that has little or no development is said to be young, and one that has strongly expressed horizons is considered old. The soils in the Antelope Valley Area range from very young to possibly many hundreds of thousands of years in age. The youngest are on recent alluvial fans, and the oldest are on high terraces and on other areas underlain by rock.

Older soils are likely to be less fertile than younger soils and have more physical characteristics that are unfavorable for growing many plants. They are likely to have distinct horizons that have low fertility, are slowly permeable to water, and restrict the growth of roots. Leaching of bases from the upper part of the soil downward; increase in acidity; and the formation, translocation, and accumulation of clay to form a B2t horizon all are more pronounced in older soils. In addition fertility is lower, less phosphorus is available, and cementation of the subsoil into a hardpan is more

likely. Because of the increase of iron oxides and clay, older well-aerated soils have a reddish-brown B horizon, but this horizon generally is brown in younger soils.

Young soils occur throughout the survey area and are farmed intensively. Among such soils are those of the Hanford, Hesperia, Rosamond, Sorrento, and Yolo series. All of these soils respond well to management.

Soils develop more slowly in the arid desert than where rainfall is more plentiful. Consequently, less leaching and translocation of clay minerals occurs. Length of time thus accounts for the striking differences among some desert soils (18). An example is the differences between soils of the Mohave series and those of the Adelanto or Cajon series. Calcic horizons in the Merrill and Sunrise soils also indicate the influence of time on soils in arid areas (6).

Time also accounts for differences among some soils in areas of higher rainfall. For example, Hanford, Greenfield, and Ramona soils, in turn, have a progressively stronger degree of profile development. The Ramona soils are considered the oldest because they are on higher terraces assumed to be the oldest in the Area.

Morphology of Soils

Many different kinds of soils have formed in the Antelope Valley Area. Some of the soils have only faint horizons, or one or two horizons, and others have many distinct horizons and a thick solum. The differentiation of horizons in soils in this Area is the result of one or more of the following processes: (1) Accumulation of organic matter, (2) translocation and formation of clay, (3) accumulation of lime to form a lime-cemented hardpan, and (4) weathering of parent material.

The accumulation of organic matter in the Chino, Gorman, Oak Glen, and Sheridan soils, for example, is reflected in the dark-colored surface layer of those soils. In contrast, the light-colored surface layer of the Arizo and Cajon soils indicates that little organic matter is added to those soils. The translocation and formation of clay varies with the degree of leaching. It is reflected in the thick, well-developed Bt horizon in the Ramona and Ojai soils. This horizon is lacking, however, in such soils as the Sorrento and Yolo, which are only partly leached.

Examples of soils in which lime has accumulated to form a lime-cemented hardpan are the Merrill and Sunrise soils. Degree of weathering varies throughout the Area, depending upon the hardness of the parent rock. The Millsholm, Temescal, and Toomes soils, for example, are shallow and have a weakly developed profile because they formed in material from hard rock that resists weathering. In contrast, Castaic and Saugus soils are deeper because their parent material is softer and weathers more readily.

Detailed laboratory data are not available for most soils in the survey area. Consequently, horizon identification and classification of the soils was done in the field by simple tests or through observation.

Classification of Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationships to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus, in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and applied in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. They are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (2) and later revised (17). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965 (21). The current system is under continual study. Therefore, readers interested in developments of this system should search the latest literature available (10, 12, 13). The soil series of the Antelope Valley Area are placed in some categories of the current system in table 8. The classes in the current system are briefly defined in the paragraphs that follow.

ORDER: Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. The exceptions, Entisols and Histosols, occur in many different climates. Six soil orders are represented in the Antelope Valley Area--Alfisols, Aridisols, Entisols, Inceptisols, Mollisols, and Vertisols.

Alfisols are soils containing a clay-enriched B horizon that has medium or high base saturation.

Aridisols are soils in dry areas. They have a surface soil that is pale in color and generally is soft when dry or that has distinct structure.

Entisols are young mineral soils that do not have genetic horizons or have only the beginning of such horizons.

Inceptisols are mineral soils in which horizons have definitely started to develop. They generally are on young, but not recent, land surfaces.

Mollisols have formed mostly under grass. They have a thick, friable, dark-colored surface layer. Base saturation is more than 50 percent.

TABLE 8.--SOIL SERIES CLASSIFIED ACCORDING TO THE CURRENT SYSTEM OF CLASSIFICATION [1/]

Series	Family	Subgroup	Order
Adelanto	Coarse-loamy, mixed, thermic	Typic Haplargids	Aridisols.
Agua Dulce	Loamy-skeletal, mixed, thermic	Mollic Haploxeralfs	Alfisols.
Amargosa	Loamy, mixed, nonacid, thermic	Lithic Xerorthents	Entisols.
Anaverde	Fine-loamy, mixed, mesic	Pachic Haploxerolls	Mollisols.
Arizo	Sandy-skeletal, mixed, thermic	Typic Torripsamments	Entisols.
Ayar	Fine, montmorillonitic, thermic	Entic Chromoxererts	Vertisols.
Balcom	Fine-silty, mixed, calcareous, thermic	Typic Xerorthents	Entisols.
Cajon	Sandy, mixed, thermic	Typic Torripsamments	Entisols.
Calvista	Loamy, mixed, calcareous, thermic	Lithic Torriorthents	Entisols.
Castaic	Fine-silty, mixed, nonacid, thermic	Typic Xerorthents	Entisols.
Chino	Fine-loamy, mixed, thermic	Aquic Calcic Haploxerolls	Mollisols.
Cortina	Loamy-skeletal, mixed, nonacid, thermic	Typic Xerofluvents	Entisols.
Gaviota	Loamy, mixed, nonacid, thermic	Lithic Xerorthents	Entisols.
Gazos	Fine-loamy, mixed, thermic	Pachic Haploxerolls	Mollisols.
Godde	Loamy, mixed, mesic	Lithic Haploxerolls	Mollisols.
Gorman	Fine-loamy, mixed, mesic	Pachic Argixerolls	Mollisols.
Greenfield	Coarse-loamy, mixed, thermic	Typic Haploxeralfs	Alfisols.
Hanford	Coarse-loamy, mixed, nonacid, thermic	Typic Xerorthents	Entisols.
Hanford, calcareous variant.	Coarse-loamy, mixed, calcareous, thermic	Typic Xerofluvents	Entisols.
Hesperia	Coarse-loamy, mixed, nonacid, thermic	Typic Torriorthents	Entisols.
Hi Vista	Fine-loamy, mixed, thermic	Typic Haplargids	Aridisols.
Las Posas	Fine, montmorillonitic, thermic	Typic Rhodoxeralfs	Alfisols.
Lebec	Fine-loamy, mixed, mesic	Calcic Entic Haploxerolls	Mollisols.
Merrill	Fine-loamy, mixed, thermic	Typic Calcixerolls	Mollisols.
Metz	Sandy, mixed, thermic	Typic Xerorthents	Entisols.
Millsholm	Loamy, mixed, thermic	Lithic Xerochrepts	Inceptisols.
Mocho	Fine-loamy, mixed, thermic	Calcic Entic Haploxerolls	Mollisols.
Mohave	Fine-loamy, mixed, thermic	Typic Haplargids	Aridisols.
Oakdale	Coarse-loamy, mixed, thermic	Mollic Haploxeralfs	Alfisols.
Oak Glen	Coarse-loamy, mixed, thermic	Pachic Haploxerolls	Mollisols.
Oban	Fine, montmorillonitic, thermic	Typic Natrargids	Aridisols.
Ojai	Fine-loamy, mixed, thermic	Mollic Haploxeralfs	Alfisols.
Ojai, thin surface variant.	Fine-loamy, mixed, thermic	Mollic Haploxeralfs	Alfisols.
Pond	Fine-loamy, mixed, thermic	Typic Haplargids	Aridisols.
Ramona	Fine-loamy, mixed, thermic	Typic Haploxeralfs	Alfisols.
Rosamond	Fine-loamy, mixed, calcareous, thermic	Typic Torriorthents	Entisols.
Saugus	Coarse-loamy, mixed, nonacid, thermic	Typic Xerorthents	Entisols.
Sheridan	Coarse-loamy, mixed, mesic	Pachic Haploxerolls	Mollisols.
Soboba	Sandy-skeletal, mixed, thermic	Typic Xeropsamments	Entisols.
Sorrento	Fine-loamy, mixed, thermic	Calcic Haploxerolls	Mollisols.
Sunrise	Fine-loamy, mixed, thermic	Typic Calciorthids	Aridisols.
Temescal	Loamy, mixed, thermic	Lithic Xerochrepts	Inceptisols.
Toomes	Loamy, mixed, thermic	Lithic Xerochrepts	Inceptisols.
Tray	Coarse-loamy, mixed, thermic	Typic Haplargids	Aridisols.
Vernalis	Fine-loamy, mixed, thermic	Calcixerollic Xerochrepts	Inceptisols.
Vista	Coarse-loamy, mixed, thermic	Typic Xerochrepts	Inceptisols.
Wyman	Fine-loamy, mixed, thermic	Typic Haploxeralfs	Alfisols.
Yolo	Fine-silty, mixed, thermic	Typic Xerochrepts	Inceptisols.
Zamora	Fine-silty, mixed, thermic	Mollic Haploxeralfs	Alfisols.

[1/] Placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Vertisols are clayey soils that crack, shrink, and swell in all seasons and that have wide deep cracks during dry periods.

SUBORDER: Each order is subdivided into suborders, primarily on the basis of soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders have a narrower climatic range than the orders. The criteria for suborders chiefly reflect the presence or absence of waterlogging or soil differences resulting from the climate or vegetation.

GREAT GROUP: Each suborder is divided into great groups according to the presence or absence of genetic horizons and the arrangement of these horizons.

SUBGROUP: Each great group is subdivided into subgroups. One of these subgroups represents the central (typic) segment of the great group, and the others, called intergrades, contain those soils having properties of soils in another group, suborder, or order.

FAMILY: Each subgroup is divided into families, primarily on the basis of properties important to the growth of plants. Among the properties considered are texture, mineralogy, reaction, soil temperature, and thickness of horizons.

SERIES: The series consists of a group of soils that formed from a particular kind of parent material and having genetic horizons that, except for texture of the surface soils, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, consistence, reaction, and mineralogical and chemical composition.

New soil series must be established and concepts of some established series, especially older ones that have been used little in recent years, must be revised in the course of the soil survey program across the country. A proposed new series has tentative status until review of the series concept at the State, regional, and national levels of responsibility for soil classification results in a judgment that the new series should be established. Most of the soil series described in this publication have been established earlier.

ADDITIONAL FACTS ABOUT THE AREA

This section provides information about early settlement of the survey area, discusses land use and the water supply, and gives facts about the climate.

Among the early settlers in the survey area were Spanish explorers and missionaries, who introduced domestic livestock. Early settlers grazed large numbers of sheep and cattle on foothills and in valleys of the Area. The ranches generally were centered around a dependable supply of water, such as Elizabeth Lake and Hughes Lake (11).

After a severe drought in the 1880's, the number of livestock in the Area decreased sharply. Farmers in the districts of Fairmont and Neenach, as well as in other areas, began to practice dryland farming. At about the same time, irrigation was started by diverting water from mountain streams. Many hundreds of acres of irrigated orchards were planted in areas near Littlerock. Many attempts were made by developers at this time to sell land to new settlers, but most of these promotions failed.

In 1876 a branch of the Southern Pacific Lines railway was completed in the eastern and southern parts of the Area. During construction an excellent flow of water was obtained from a hand-drilled artesian well developed near the present railway station. The well supplied water not only for the trains but for residents of Lancaster. Settlers in other parts of the Area soon located other supplies of underground water. Later, improvement of gasoline engines and development of electric pumps for pumping water assured dependable supplies of water for many communities. Expansion of irrigation also was made possible.

Nearly all land in the survey area is privately owned. Tejon Ranch and the old Temescal land grant still reflect the extensive land holdings prior to the Mexican War. Most early settlers obtained land under the Homestead Act. Promoters obtained a few large tracts, however, from holdings of the Southern Pacific Lines, and then resold to private individuals.

Water Supply

Most of the water for domestic, municipal, industrial, and agricultural use is obtained from ground water. The water is pumped from vast alluvial deposits that underlie Antelope Valley and similar physiographic regions throughout the survey area. Some surface water is stored in reservoirs and distributed by the Palmdale Irrigation District for farming use and for other purposes.

Estimates based on records of electric power plants, pumping plants, and other sources indicate that about 480,000 acre-feet of ground water was pumped in the Antelope Valley Area in 1953 (14). The principal use is for irrigating alfalfa and other crops. Irrigated acreage has increased rapidly since 1944. About 58,500 acres is now under irrigation.

Since pumping of water started, the ground water level has steadily declined. Records kept for individual artesian wells indicate a decline of from 5 to 8 feet a year. The Antelope Valley-East Kern Water Agency estimates that the overdraft in Antelope Valley and in other places in the southwestern part of the survey area is about 175,000 acre-feet a year. Some of the water is replaced by rain and snow that falls within the Area. The exact amount of ground water available for use is not known. It is estimated, however, that the supply of ground water, particularly in Antelope Valley, will last for 35 to 65 years, depending on the rate of future growth of the Area (14).

Most of the ground water is of excellent quality (3). In only a few areas is the water known to be of poor quality.

Additional water will be supplied to the Area by the east branch of the California Aqueduct, which is presently under construction. Part of this Aqueduct is being built along the southern edge of Antelope Valley.

Climate [4]

In most of the Antelope Valley Area, the temperature is moderate to warm throughout the year. Cooler temperatures prevail in the high mountains, however, and the desert may be hot in summer. Rainfall ranges from low in the desert to moderate in the western valleys and to moderately heavy in the mountains. Little snow falls at low elevations, but snowfall is as much as 80 inches at high elevations. Except in the high mountains, the growing season is long enough to permit maturity of the crops commonly grown. Most of the rain comes in winter, and irrigation is necessary for growth of many crops.

Table 9, compiled from records kept at three different weather stations in Los Angeles County, gives temperature and precipitation data considered representative of the desert, the high mountains, and the coastal areas. Palmdale, at the edge of Antelope Valley, has a warm desert climate; Sandberg, in the high mountains, is considerably cooler; and San Fernando, in the coastal area, has a moderate, more humid climate.

Summers in the desert generally are warm to hot. The average highest temperatures are in the upper 90's, and temperatures of more than 100° F. are common. The average lowest temperature, on the other hand, is in the middle 60's, and in some years it drops to the 40's. Summer temperatures are about the same in the western valleys. In the high mountains temperatures average about 80° in summer, but they are likely to rise to the 90's or drop to the low 50's.

Winters are cool in the desert. The average highest temperature is in the upper 50's, but on many days the temperature rises to 80°. On the average, minimum temperatures are near 30°, though temperatures sometimes are as low as 5° or 10° above zero. Winters are a few degrees warmer in the western valleys than in the desert, but they are cooler in the mountains.

Total annual precipitation is 15 to 20 inches in the coastal valleys. It is more than 35 inches in the high mountains but less than 5 inches in parts of Antelope Valley. Once in 10 years less than 4 inches of moisture is received in the desert, 9 inches is received in the coastal areas, and 5 inches falls in the mountains. The chance is 1 year in 10 that precipitation is more than 22 inches in the mountains, 31 inches in coastal valleys, and nearly 17 inches in the desert Rainy days number about 20 in the desert, 35 in the coastal valleys, and 45 in the mountains. An isohyetal map (fig. 3) has been prepared to show the annual precipitation in the Antelope Valley Area. The lines on this map mark areas of equal precipitation (isohyets).

The growing season, or the number of days between the last freezing temperature of 32° in spring and the date of the first temperature of 32° in fall, varies from place to place. It is more than 300 days in the coastal valleys, is about 200 days in the mountain valleys, and is less than 150 days in the high mountains. The average date of the last 32° temperature in spring is about March 1 in the coastal valleys, near April 1 in the desert, and after June 1 in the mountains. In fall the average date of the last 32° temperature is late in November in the coastal valleys, early in November in the desert, and late in October in the mountains. The probability of freezing temperatures after specified dates in spring and before specified dates in fall are given in table 10. The data are from the same three weather stations for which data was compiled for table 9.

An average of about 90 percent of possible sunshine, or about 3,600 hours, is received in the desert annually. In coastal valleys sunshine is about 75 percent of possible, or 3,200 hours annually. The highest percentage of sunshine is received in summer and fall, and the lowest, in winter and spring.

Data are not available on relative humidity in the Area, but estimates based on other data available show that in the coastal valleys relative humidity probably ranges between 50 and 75 percent. Humidity generally is highest in the coastal valleys on summer nights and early in the morning. In the desert humidity is highest in winter and averages about 50 percent at night and 35 percent during the day. In summer relative humidity in the desert is about 20 to 25 percent much of the time. A few times each year strong wind blowing from the north or east causes the humidity in the desert to drop below 10 percent.

More water is lost from open areas of water in the desert than in other places in the survey area. Annual evaporation from a standard 4-foot pan is more than 110 inches in the desert, about 70 inches in the coastal valleys, and about 50 inches in the mountains. In the desert evaporation from lakes and reservoirs is about 65 percent of the pan figure, and in the coastal areas, it is about 75 percent. About 75 percent of the annual evaporation in the desert occurs in the months of May through October. During this period the loss in the desert is 75 percent, and that in the coastal valleys is 66 percent.

Potential evapotranspiration for a 12 month period averages about 35 inches in the desert and less than 24 inches in the mountains. For the growing season, or between the last freezing temperature at 32° in spring and the first in fall, potential

[4] By C. Robert Elford and John E. Stilz, ESSA, Weather Bureau, State climatologist and assistant climatologist, respectively.

TABLE 9.--TEMPERATURE AND PRECIPITATION DATA FOR THREE WEATHER STATIONS IN THE ANTELOPE VALLEY AREA, CALIF. 1/

Palmdale, Calif.
[Elevation 2,665 feet]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with--		Average monthly total	One year in 10 will have--		Days with snow cover	Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than--	Minimum temperature equal to or lower than--		Less than--	More than--		
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Number	Inches
January-------	58	31	70	21	1.7	(3/)	4.5	(2/)	2.8
February------	61	34	73	25	1.8	(3/)	4.4	(2/)	(3/)
March---------	67	38	79	29	1.4	(3/)	2.9	0	0
April---------	74	44	88	34	.6	(3/)	1.8	0	0
May-----------	81	50	94	40	.1	0	.4	0	0
June----------	89	57	101	46	(3/)	0	.2	0	0
July----------	98	65	107	54	(3/)	0	.1	0	0
August--------	97	63	106	53	.2	0	1.1	0	0
September-----	92	57	103	46	.2	0	1.3	0	0
October-------	80	48	93	36	.4	0	1.3	0	0
November------	68	37	79	27	.6	0	1.9	0	0
December------	59	33	72	23	1.8	(3/)	4.8	(2/)	(3/)
Year------	77	46	4/ 108	5/ 18	8.9	3.6	16.6	(2/)	.2

Sandberg, Calif.
[Elevation 4,517 feet]

Month	Average daily maximum	Average daily minimum	Maximum temperature equal to or higher than--	Minimum temperature equal to or lower than--	Average monthly total	Less than--	More than--	Days with snow cover	Average depth of snow on days with snow cover
January-------	46	34	60	23	2.6	.3	6.4	6	5
February------	48	35	62	24	2.6	.3	7.1	2	8
March---------	53	37	67	26	1.4	.1	4.2	3	6
April---------	60	42	76	30	1.0	.1	2.7	(2/)	4
May-----------	67	46	82	34	.3	(3/)	1.0	(2/)	6/18
June----------	76	54	90	40	(3/)	0	.1	0	0
July----------	86	63	94	52	(3/)	0	(3/)	0	0
August--------	85	62	93	50	.1	0	.4	0	0
September-----	80	59	92	44	.2	0	.8	0	0
October-------	68	50	83	36	.5	0	1.7	0	0
November------	56	42	69	30	.9	(3/)	3.0	1	3
December------	49	37	62	26	2.5	.1	4.3	2	3
Year------	64	47	4/ 97	5/ 18	12.1	4.8	22.9	14	5

San Fernando, Calif.
[Elevation 977 feet]

Month	Average daily maximum	Average daily minimum	Maximum temperature equal to or higher than--	Minimum temperature equal to or lower than--	Average monthly total	Less than--	More than--	Days with snow cover	Average depth of snow on days with snow cover
January-------	64	43	77	31	3.5	.3	9.9	--	--
February------	66	43	77	32	3.7	.3	9.5	--	--
March---------	70	44	84	34	2.6	(3/)	9.4	--	--
April---------	75	47	90	38	1.5	.1	4.0	--	--
May-----------	79	49	94	40	.3	0	.8	--	--

TABLE 9.--TEMPERATURE AND PRECIPITATION DATA FOR THREE WEATHER STATIONS IN THE ANTELOPE VALLEY AREA, CALIF. 1/--Continued

Month	Average daily maximum	Average daily minimum	Temperature: Two years in 10 will have at least 4 days with-- Maximum temperature equal to or higher than--	Temperature: Two years in 10 will have at least 4 days with-- Minimum temperature equal to or lower than--	Precipitation: Average monthly total	Precipitation: One year in 10 will have-- Less than--	Precipitation: One year in 10 will have-- More than--	Days with snow cover	Average depth of snow on days with snow cover
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Number	Inches
June----------	85	52	96	44	.1	0	.4	--	--
July----------	93	56	104	47	(3/)	0	.1	--	--
August--------	92	55	102	48	(3/)	0	.1	--	--
September-----	90	54	103	45	.2	0	.3	--	--
October-------	81	50	97	41	.5	0	1.7	--	--
November------	74	48	88	35	1.2	0	3.9	--	--
December------	66	45	80	34	3.3	.2	7.7	--	--
Year------	78	49	4/ 108	5/ 29	16.9	8.7	31.4	--	--

1/ Palmdale and San Fernando data for period 1931-60; Sandberg average daily temperatures and average monthly precipitation for period 1931-60, maximum and minimum temperatures and chance of precipitation for period 1932-60, and snow data for period 1935-60.

2/ Less than one half day.

3/ Trace.

4/ Average highest annual maximum.

5/ Average lowest annual minimum.

6/ 1 day in 25 years.

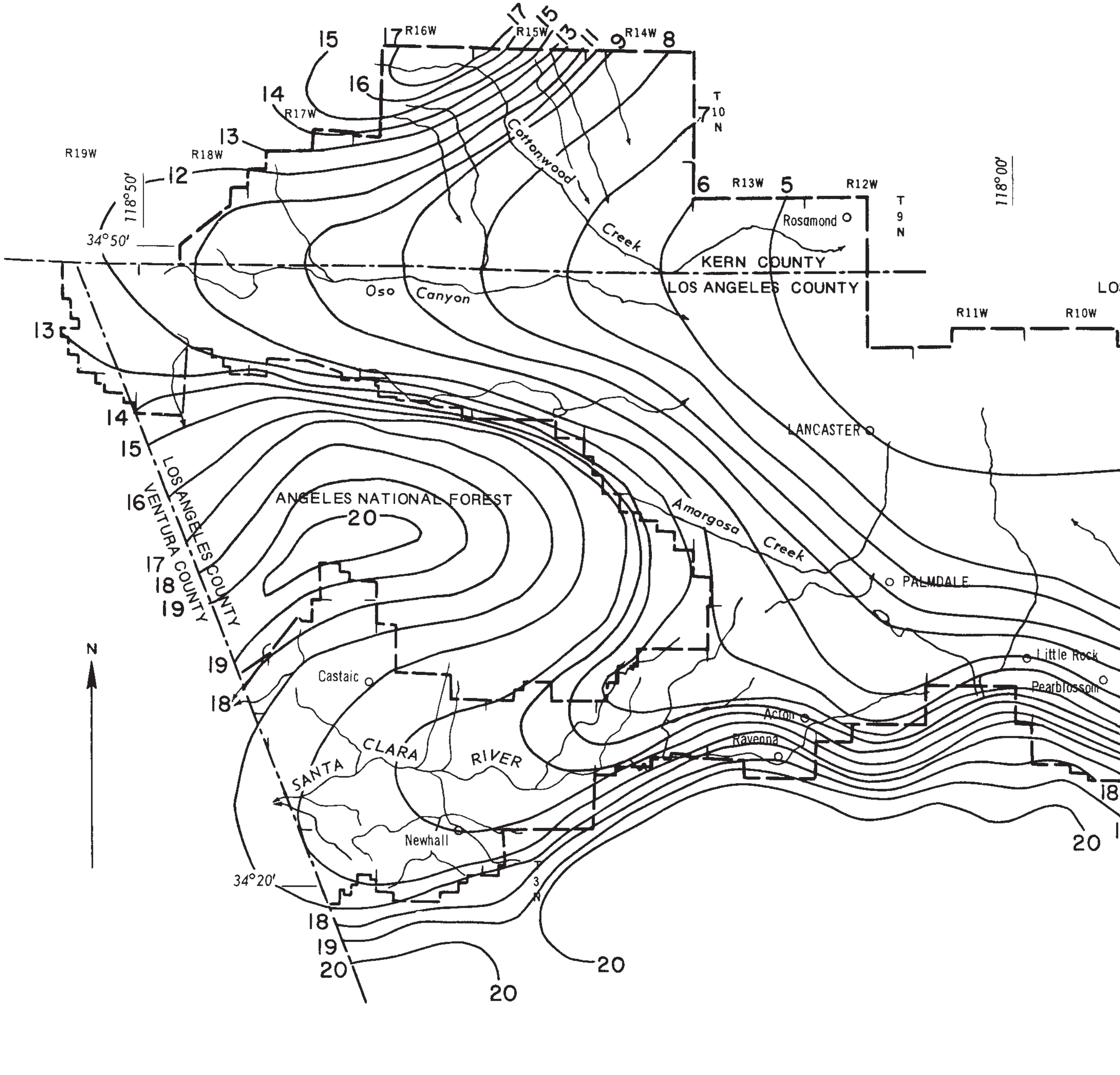

Figure 3.--Average annual precipitation in the Antelope Valley Area.

TABLE 10.--PROBABILITIES OF LAST FREEZING TEMPERATURES IN SPRING AND THE FIRST IN FALL

Palmdale, Calif.
[For the period 1933-61]

Probability	Dates for given probability at temperature of--				
	16 F.	20 F.	24 F.	28 F.	32 F.
Spring:					
1 year in 10 later than--------	January 18-----	February 15---	March 19-------	March 27--------	April 22.
2 years in 10 later than-------	January 1------	February 6----	March 6--------	March 18--------	April 13.
5 years in 10 later than-------	(1/)-----------	January 15----	February 13---	March 3---------	March 28.
Fall:					
1 year in 10 earlier than------	December 15----	December 3----	November 20----	November 10-----	October 26.
2 years in 10 earlier than-----	December 24----	December 9----	November 26----	November 14-----	November 1.
5 years in 10 earlier than-----	(2/)-----------	December 29---	December 8-----	November 25-----	November 6.

Sandberg, Calif.
[For the period 1933-62]

Probability	16 F.	20 F.	24 F.	28 F.	32 F.
Spring:					
1 year in 10 later than--------	February 9-----	February 22---	April 2--------	May 2-----------	May 28.
2 years in 10 later than-------	January 20-----	February 4----	March 25-------	April 24--------	May 19.
5 years in 10 later than-------	(1/)-----------	January 1-----	March 6--------	April 6---------	May 3.
Fall:					
1 year in 10 earlier than------	(2/)-----------	December 18---	November 22----	October 31------	October 16.
2 years in 10 earlier than-----	(2/)-----------	December 28---	November 23----	November 9------	October 25.
5 years in 10 earlier than-----	(2/)-----------	(2/)----------	December 12----	November 25-----	November 12.

San Fernando, Calif.
[For the period 1931-60]

Probability	16 F.	20 F.	24 F.	28 F.	32 F.
Spring:					
1 year in 10 later than--------	(1/)-----------	(1/)----------	(1/)-----------	February 7------	April 5.
2 years in 10 later than-------	(1/)-----------	(1/)----------	(1/)-----------	January 25------	March 26.
5 years in 10 later than-------	(1/)-----------	(1/)----------	(1/)-----------	(1/)------------	March 3.
Fall:					
1 year in 10 earlier than------	(2/)-----------	(2/)----------	(2/)-----------	December 31-----	November 13.
2.years in 10 earlier than-----	(2/)-----------	(2/)----------	(2/)-----------	(2/)------------	November 23.
5 years in 10 earlier than-----	(2/)-----------	(2/)----------	(2/)-----------	(2/)------------	December 16.

1/ Before January 1.

2/ After December 31.

evapotranspiration is 30 inches in the desert and less than 20 inches in the mountains. The actual evapotranspiration for a 12 month period is less than 6 inches in the desert and 10 to 12 inches in the mountains. Thus, the actual evapotranspiration for the growing season is less than 2 inches in the desert, 4 inches in the mountains, and 10 to 12 inches in the coastal areas.

Winds generally are light to moderate in intensity. Strong winds blow over the Area from time to time, however, and they are strongest in the desert and in the mountains. Once in 25 years, windspeeds reach 55 to 60 miles per hour, depending upon local terrain.

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Alkali soil. Generally, a highly alkaline soil. Specifically, an alkali soil has so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that the growth of most crop plants is low from this cause.

Alluvial fan. A fan-shaped deposit of sand, gravel, and fine material dropped by a stream where it flows out onto a level plain or meets a slower stream.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available moisture capacity (also termed available moisture holding capacity or available water holding capacity). Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coeffiecient, or about 15 atmospheres of tension. In this survey five classes are used, and they are defined as follows:

	Inches
Very high	More than 7.5
High	5.0-7.5
Moderate	3.75-5.0
Low	2.0-3.75
Very low	Less than 2.0

Calcareous soil. A soil containing enough calcium carbonate (often with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in many soils of warm-temperate areas, as in the Southwestern States. The material may consist of soft, thin layers in the soil or of hard, thick beds just beneath the solum, or it may be exposed at the surface by erosion.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are--

<u>Loose</u>.--Noncoherent when dry or moist; does not hold together in a mass.

<u>Friable</u>.--When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

<u>Firm</u>.--When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

<u>Plastic</u>.--When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

<u>Sticky</u>.--When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

<u>Hard</u>.--When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

<u>Soft</u>.--When dry, breaks into powder or individual grains under very slight pressure.

<u>Cemented</u>.--Hard and brittle; little affected by moistening.

Depth, soil. See Effective rooting depth.

Desert pavement. A space in a desert where the soil has been blown or washed away, leaving a covering of stones on the surface.

Drainage, altered. Changes in drainage commonly as the result of reclamation through artificial drainage or irrigation, but also because of natural deepening of the stream channels, the filling of depressions, or from wetness caused by seepage from drainage ditches or irrigation channels.

Drainage, natural. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

<u>Excessively drained</u> soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

<u>Somewhat excessively drained</u> soils are also very permeable and are free from mottling throughout their profile.

<u>Well-drained</u> soils are nearly free from mottling and are commonly of intermediate texture.

<u>Moderately well drained</u> soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

<u>Somewhat poorly drained</u> soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottlings below 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Effective rooting depth. Depth to a claypan, bedrock, or any other layer in the soil that would stop or would hinder the penetration of roots. It is the depth of soil readily penetrated by roots. Depth classes are: Very deep, more than 60 inches; deep, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Effervescence. The fizz observed when dilute hydrochloric acid is applied to a soil containing free carbonates. The amount of effervescence is divided into four classes--very slightly effervescent, slightly effervescent, strongly effervescent, and violently effervescent.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fallow. Cropland left idle in order to restore productivity, mainly through accumulation of water, nutrients, or both. Summer fallow is a common stage before cereal grain in regions of limited rainfall. The soil is tilled for at least one growing season to control weeds, to aid decomposition of plant residues, and to encourage the storage of moisture for the succeeding grain crop.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable. For the purpose of this survey, fertility is based on the content of organic matter as follows: Very low, less than 0.6 percent; low, 0.6 to 1.2 percent, moderate, 1.2 to 2.0 percent; high, 2.0 to 4.0 percent; very high, more than 4.0 percent.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has been allowed to drain away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capacity, normal moisture capacity, or capillary capacity.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material may be sandy or clayey, and it may be cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.--The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.--The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.--The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.--The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R horizon.--Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Igneous rock. A rock produced by the cooling of melted mineral material, such as granite, andesite, diorite, and basalt.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation commonly used in this survey area are--

Border.--Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Furrow.--Water is applied in small ditches made by cultivation implements used for tree and row crops.

Sprinkler.--Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Leaching. The removal of soluble materials from the soils by percolating water.

Leveling (of land). The reshaping, or modification of the soil surface to a planned grade to permit uniform distribution of irrigation water without erosion or to provide proper surface drainage.

Lime. Chemically, lime is calcium oxide, but as the term is commonly used, it is also calcium carbonate and calcium hydroxide.

Agricultural lime refers to ground limestone, hydrated lime, or burned lime, with or without magnesium minerals.

Metamorphic rocks. Rocks of any origin that have been completely changed physically by pressure, heat, and movement. Such rocks are nearly always crystalline. Examples: Mica schist and serpentine.

Microrelief. Minor surface irregularities of the land, such as low mounds or pits.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage.

Munsell notation. A system for designating color by degrees of the three simple variables--hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Percent slope. The gradient of any particular slope expressed as the difference in elevation in feet between two points 100 feet apart horizontally.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are:

	Inches per hour
Very slow	Less than 0.06
Slow	0.06-0.20
Moderately slow	0.20-0.63
Moderate	0.63-2.00
Moderately rapid	2.00-6.30
Rapid	6.30-20.0
Very rapid	More than 20.0

Piping. The movement of soil particles by percolating water leading to the development of channels.

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. In words, the degrees of acidity or alkalinity are expressed thus:

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Saline soil. A soil that contains soluble salts in amounts that impair growth of plants but that does not contain excess exchangeable sodium.

Saline-alkali soil. A soil that contains a harmful quantity of salts and either a high degree of alkalinity, a large amount of exchangeable sodium, or both, so distributed in the soil profile that growth of most crop plants is less than normal.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Sedimentary rock. A rock largely composed of particles deposited from suspension in water. The chief sedimentary rocks are conglomerate, from gravel; sandstone, from sand; shale, from clay; and limestone, from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sands have been consolidated into sandstone.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are--platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are (1) single grain (each grain by itself, as in dune sand) or (2) massive (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Surface soil or layer. The soil ordinarily moved

in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which plants (specifically sunflower) wilt so much that they do not recover when placed in a dark, humid atmosphere.

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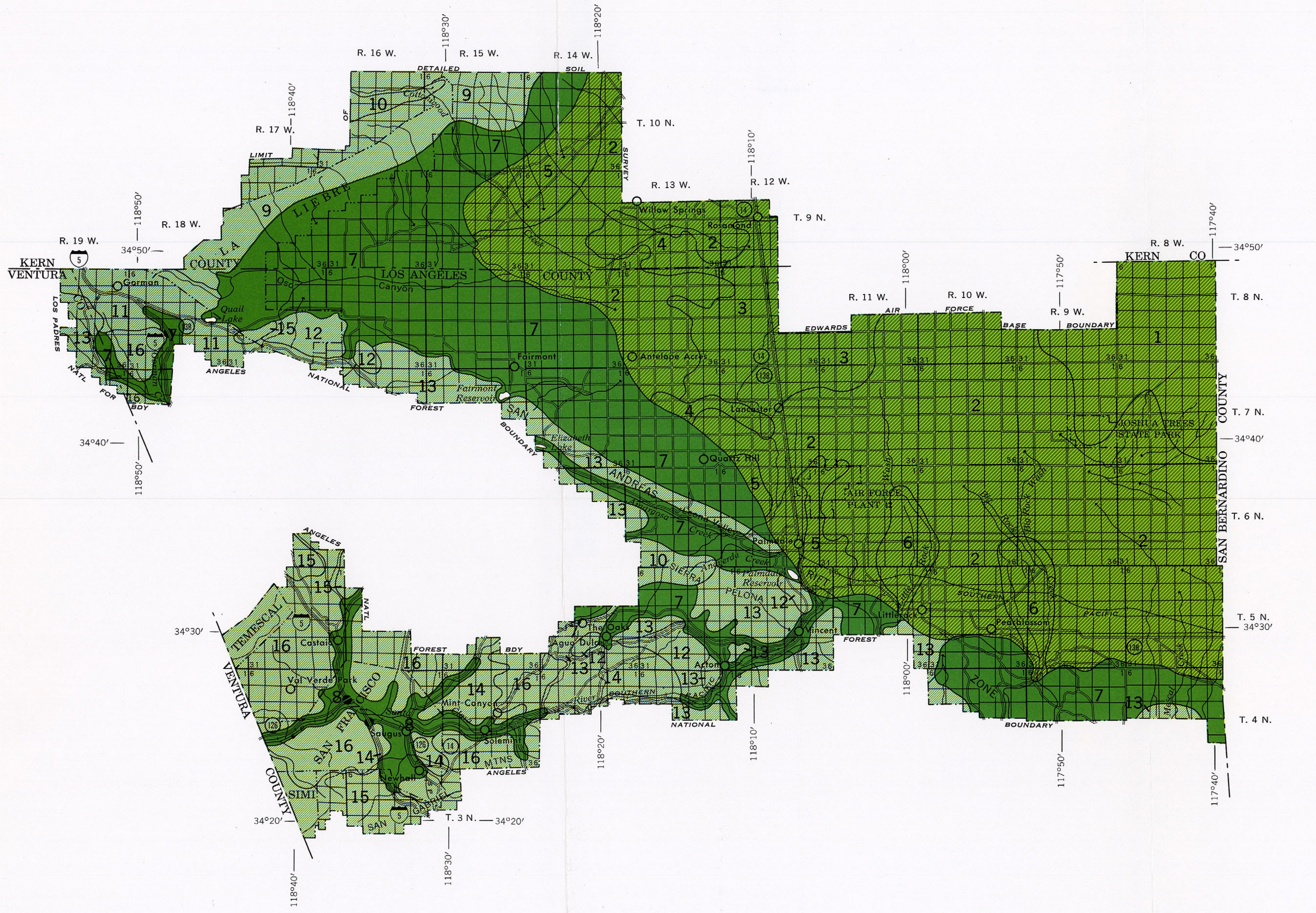

SOIL ASSOCIATIONS

SOILS OF THE MOJAVE DESERT

1 — Calvista-Hi Vista association: Gently sloping to moderately steep, well-drained soils that have a sandy loam or loamy fine sand surface layer; shallow to moderately deep over granite; on low hills

2 — Hesperia-Rosamond-Cajon association: Nearly level to strongly sloping, moderately well drained to excessively drained, very deep soils that have a loamy sand to silty clay loam surface layer; on recent alluvial fans

3 — Pond-Tray-Oban association: Nearly level, moderately well drained, very deep soils that have a fine sand to silty clay loam surface layer; in basins

4 — Sunrise association: Nearly level, moderately well drained soils that have a loamy fine sand to loam surface layer; shallow to moderately deep over caliche; on the basin rim

5 — Adelanto association: Nearly level to gently sloping, well-drained, very deep soils that have a loamy sand or gravelly sandy loam surface layer; on alluvial fans and terraces

6 — Arizo association: Nearly level to gently sloping, excessively drained, very deep soils that have a loamy fine sand or gravelly loamy sand surface layer; on alluvial fans

SOILS OF THE ALLUVIAL FANS AND TERRACES

7 — Hanford-Ramona-Greenfield association: Nearly level to moderately steep, well-drained, very deep soils that have a loamy sand to loam surface layer; on alluvial fans and terraces

8 — Yolo-Metz-Cortina association: Nearly level to moderately sloping, well-drained to excessively drained, very deep soils that have a loam to loamy sand surface layer; on alluvial fans and flood plains

SOILS OF THE UPLANDS

9 — Sheridan-Lebec association: Moderately steep to steep, well-drained soils that have a sandy loam or loam surface layer; moderately deep over granite or limestone; on foothills and mountains

10 — Anaverde-Godde association: Moderately steep to steep, well-drained soils that have a loam surface layer; deep to shallow over schist; on foothills and mountains

11 — Oak Glen-Gorman association: Nearly level to steep, well-drained, very deep soils that have a sandy loam to loam surface layer; on alluvial fans and foothills

12 — Las Posas-Toomes-Temescal association: Strongly sloping to steep, well-drained or somewhat excessively drained soils that have a loam or sandy loam surface layer; moderately deep to shallow over basalt or andesite; on foothills

13 — Vista-Amargosa association: Strongly sloping to steep, well-drained to excessively drained soils that have a coarse sandy loam surface layer; moderately deep to shallow over granite; on foothills and mountains

14 — Ojai-Agua Dulce association: Gently sloping to steep, well-drained, very deep to moderately deep soils that have a loam or stony loam surface layer; on terraces and foothills

15 — Gaviota-Millsholm association: Moderately steep or steep, well-drained and somewhat excessively drained soils that have a sandy loam or loam surface layer; shallow over sandstone or shale; on foothills

16 — Saugus-Castaic-Balcom association: Gently sloping to very steep, well-drained soils that are loam to silty clay loam throughout; deep to moderately deep over soft sandstone or shale; on foothills and mountains

January 1968

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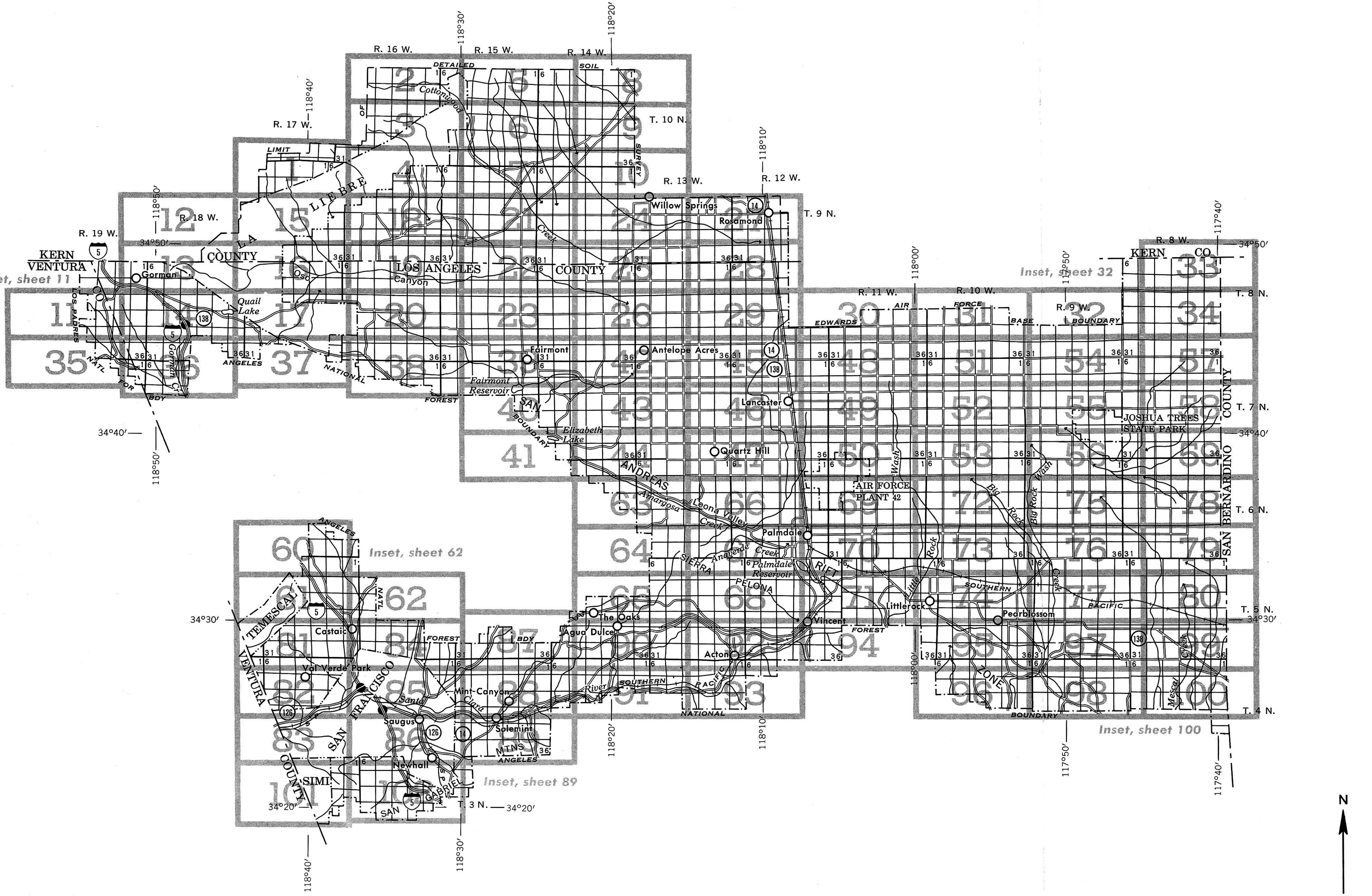
U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE
UNIVERSITY OF CALIFORNIA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
ANTELOPE VALLEY AREA
PORTIONS OF KERN, LOS ANGELES, AND VENTURA COUNTIES, CALIFORNIA

Scale 1:380 160

1 0 1 2 3 4 5 6 Miles



INDEX TO MAP SHEETS

ANTELOPE VALLEY AREA

PORTIONS OF KERN, LOS ANGELES, AND VENTURA COUNTIES, CALIFORNIA

Scale 1:380 160

1 0 1 2 3 4 5 6 Miles

SOIL EROSION HAZARD
East Half

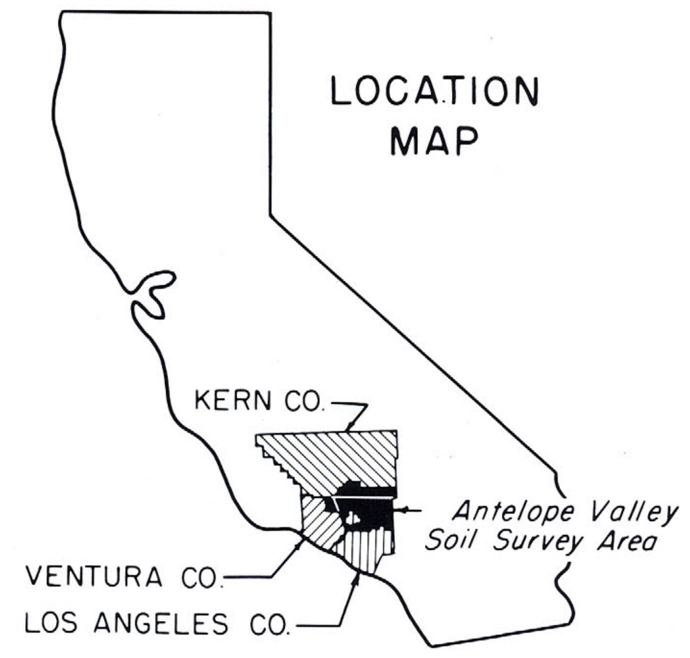
ANTELOPE VALLEY AREA

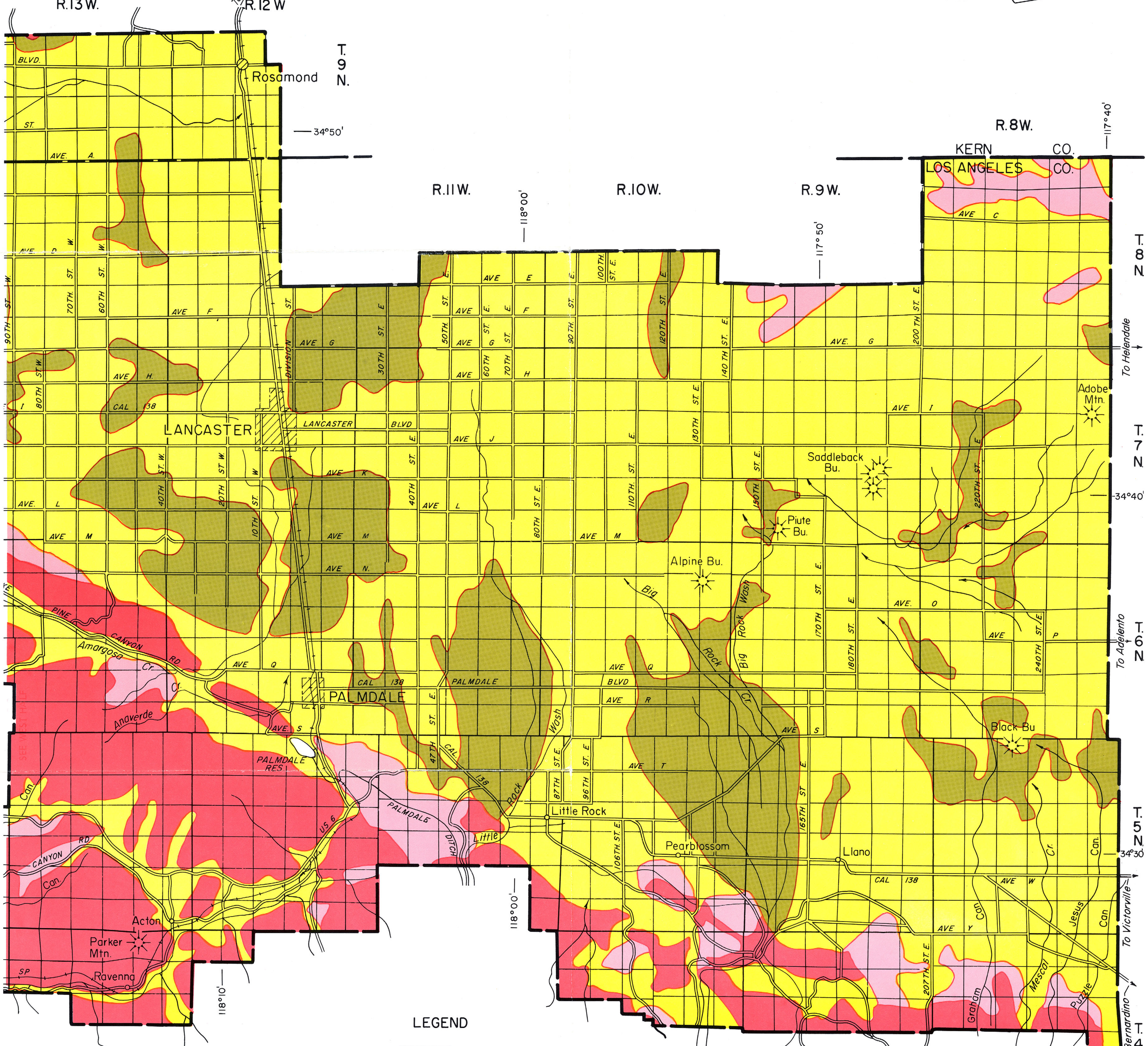
CALIFORNIA

AUGUST 1969

SCALE IN MILES

SCALE 1:126,720





LEGEND

None to slight

Moderate

High

Very high

Estimated hazard of wind and/or water erosion if the soil is cultivated, heavily grazed, or otherwise left bare.

This map was prepared from detailed soil maps and generalized to the scale of 2 miles equals one inch.

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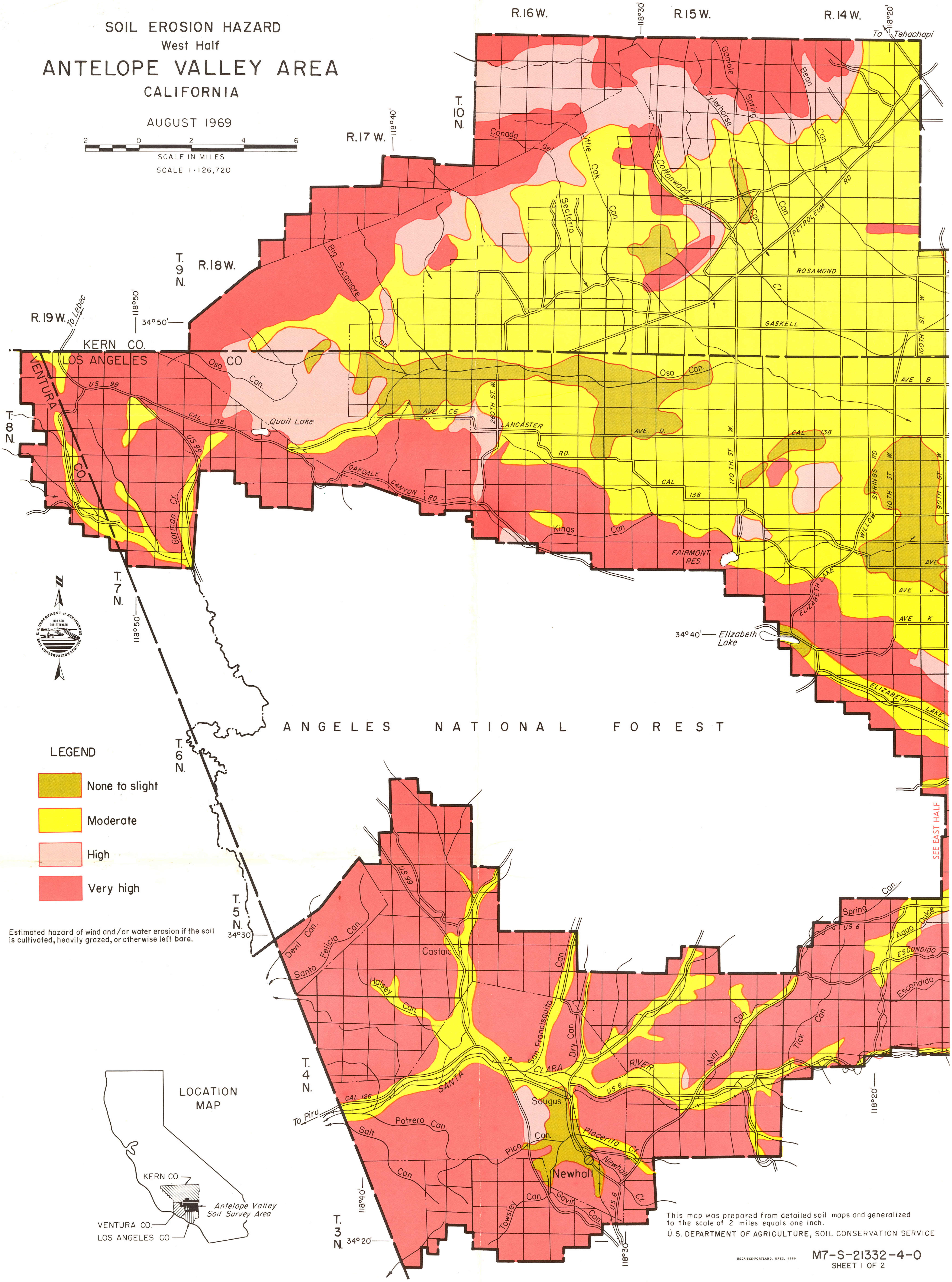
SHEET 2 OF 2

SOIL EROSION HAZARD
West Half
ANTELOPE VALLEY AREA
CALIFORNIA
AUGUST 1969



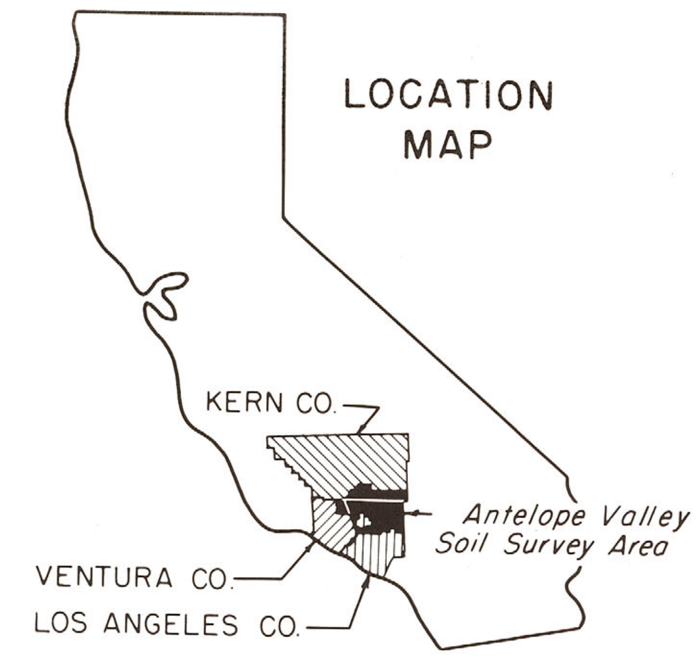
SUITABILITY FOR FARMING
East Half

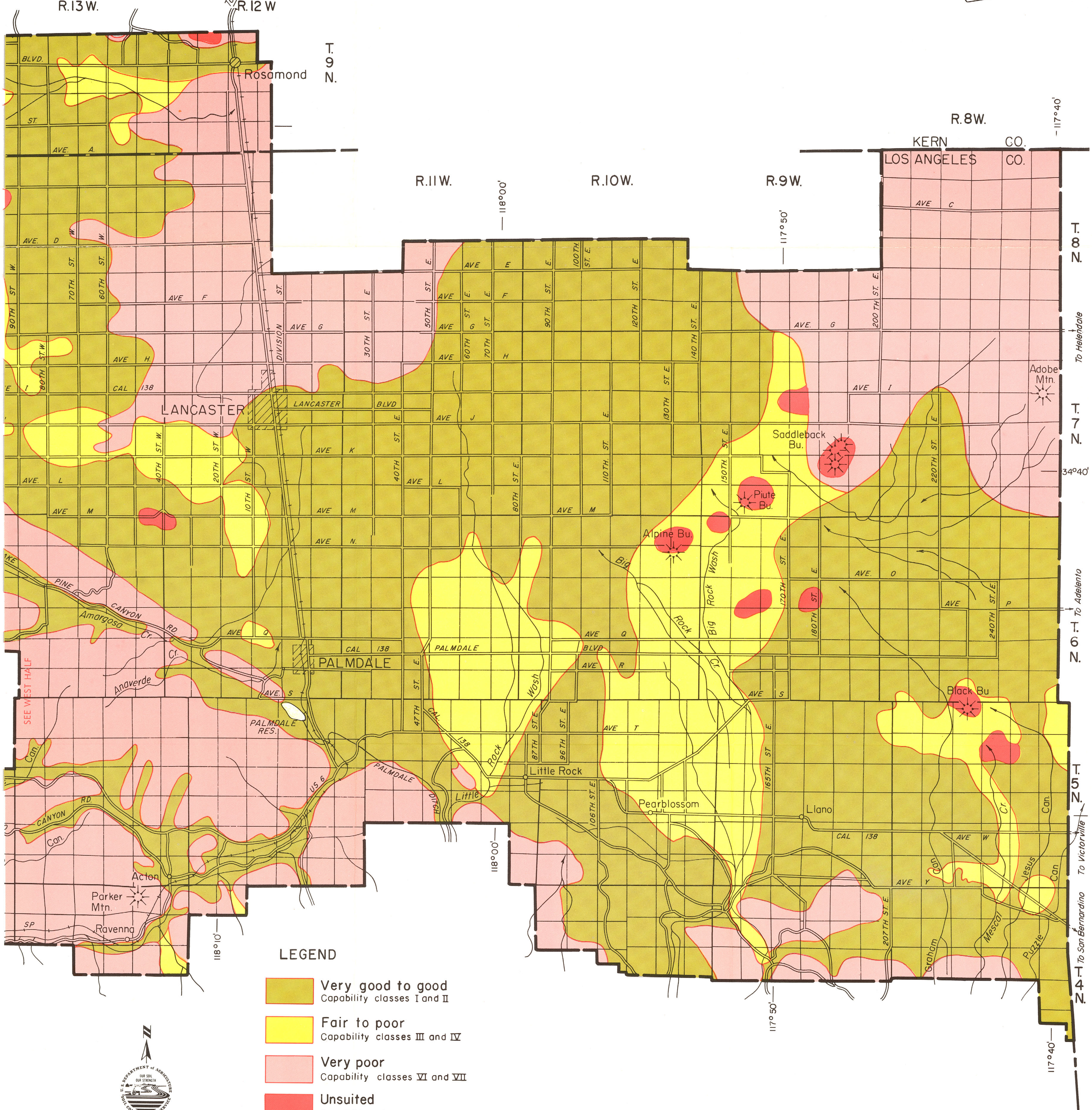
ANTELOPE VALLEY AREA

CALIFORNIA

AUGUST 1969

2 0 2 4 6
SCALE IN MILES
SCALE 1:126,720





LEGEND

- Very good to good — Capability classes I and II
- Fair to poor — Capability classes III and IV
- Very poor — Capability classes VI and VII
- Unsuited — Capability class VIII

For definition of capability classes see Farm and Nonfarm Uses of the Soils in the Soil Survey of the Antelope Valley Area, California.

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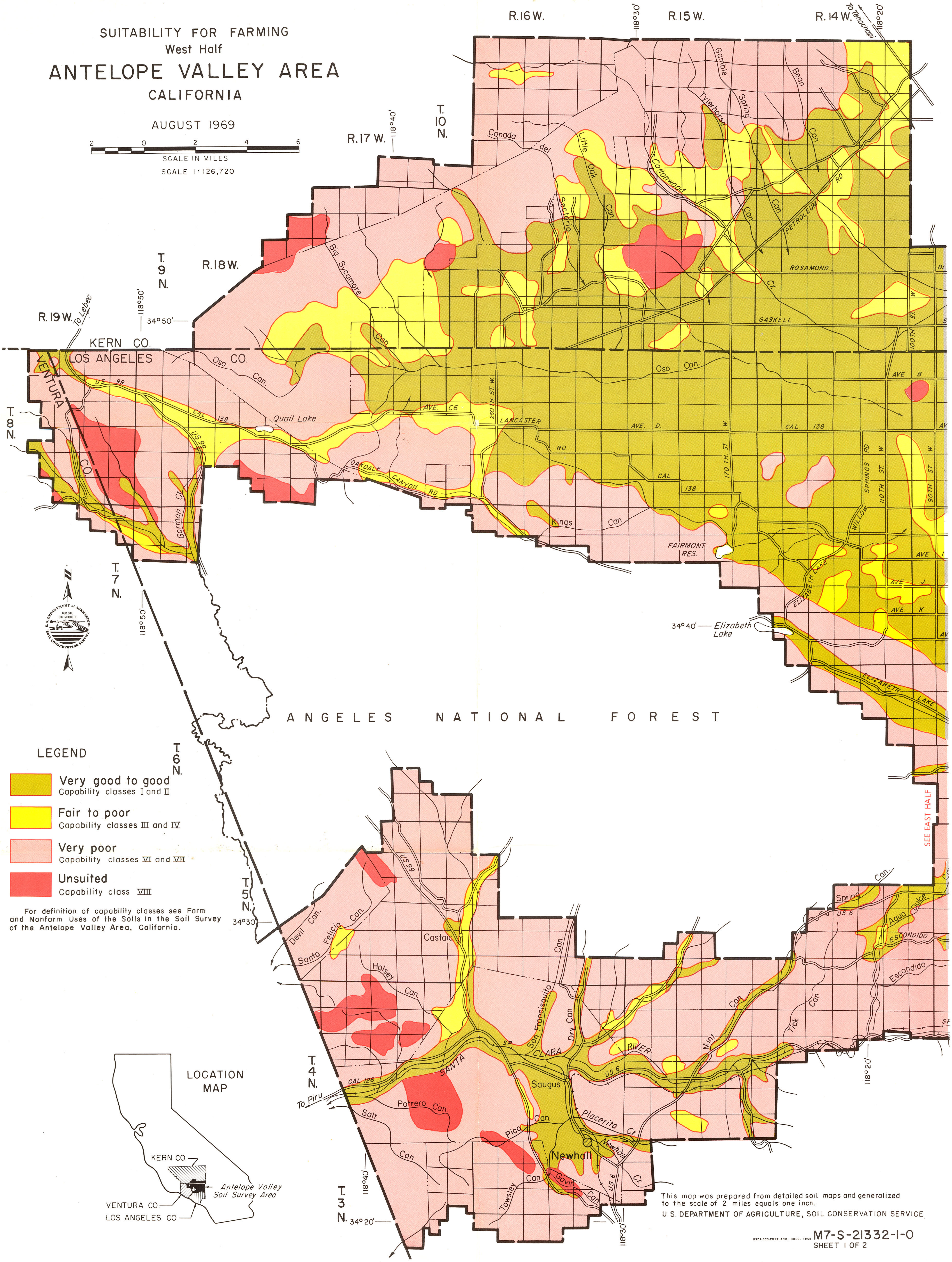
SUITABILITY FOR FARMING
West Half
ANTELOPE VALLEY AREA
CALIFORNIA

AUGUST 1969



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SHEET 1 OF 2

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the soil series to which the mapping unit belongs.

Dashes in the range site column mean that the particular mapping unit is not used for range because of lack of sufficient forage. Other information is given in tables or text as follows:

Acreage and extent, table 1, p. 66.
Estimated yields, table 2, p. 94.
Storie index, table 3, p. 101.
Engineering uses of the soils, tables 5, 6, and 7, pp. 122 through 171.
Vegetative soil groups, p. 100.
Windbreak groups, p. 110.
Wildlife groups, p. 111.
Recreation and related purposes, p. 114.

Map symbol	Mapping unit	Described on page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Range site Number	Range site Page	Vegetative soil group	Windbreak group	Wildlife group
AaB	Adelanto loamy sand, 2 to 5 percent slopes	10	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	B	2	2
AcA	Adelanto coarse sandy loam, 0 to 2 percent slopes	9	IIe-4 (30)	84	VIIe-1 (30)	90	7	109	A	1	1
AdB	Adelanto gravelly sandy loam, 2 to 5 percent slopes	10	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	B	2	2
AgF	Agua Dulce stony loam, 30 to 50 percent slopes	11	-----	--	VIIe-1 (19)	89	2	107	J	5	1
AmF2	Amargosa rocky coarse sandy loam, 9 to 55 percent slopes, eroded	12	-----	--	VIIe-1 (19)	89	4	108	J	5	4
AnE	Anaverde loam, 15 to 30 percent slopes	12	-----	--	VIe-1 (20)	89	2	107	A	5	5
ApF	Anaverde rocky loam, 30 to 50 percent slopes	13	-----	--	VIIe-1 (20)	89	2	107	J	5	5
AsB	Arizo gravelly loamy sand, 0 to 5 percent slopes	13	-----	--	VIIe-4 (30)	90	8	109	J	5	2
AtA	Arizo loamy fine sand, 0 to 2 percent slopes	14	IVe-4 (30)	87	VIIe-4 (30)	90	8	109	B	2	2
AyD	Ayar clay loam, 5 to 15 percent slopes	14	IVe-1 (19)	87	-----	--	1	107	A	5	1
CaA	Cajon loamy sand, 0 to 2 percent slopes	15	IIIe-4 (30)	85	VIIe-4 (30)	90	8	109	B	2	2
CaC	Cajon loamy sand, 2 to 9 percent slopes	16	IIIe-4 (30)	85	VIIe-4 (30)	90	8	109	B	2	2
CbA	Cajon loamy sand, loamy substratum, 0 to 2 percent slopes	16	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	B	2	2
CcA2	Cajon loamy fine sand, 0 to 2 percent slopes, hummocky	16	IIIe-4 (30)	85	VIIe-4 (30)	90	8	109	B	2	2
CcD2	Cajon loamy fine sand, 9 to 15 percent slopes, hummocky	16	IIIe-4 (30)	85	VIIe-4 (30)	90	8	109	B	2	2
ChC	Calvista-Hi Vista complex, 2 to 9 percent slopes	17	-----	--	VIIe-4 (30)	90	9	109	J	5	4
ChE	Calvista-Hi Vista rocky complex, 9 to 30 percent slopes	18	-----	--	VIIe-4 (30)	90	9	109	J	5	4
CkC	Castaic silty clay loam, 2 to 9 percent slopes	19	IIIe-1 (19)	85	-----	--	1	107	A	1	1
CkD	Castaic silty clay loam, 9 to 15 percent slopes	19	IIIe-1 (19)	85	-----	--	1	107	A	1	1
CmD	Castaic-Balcom silty clay loams, 9 to 15 percent slopes	18	IIIe-1 (19)	85	-----	--	1	107	A	1	1
CmE	Castaic-Balcom silty clay loams, 15 to 30 percent slopes	19	IVe-1 (19)	87	-----	--	1	107	A	1	1
CmF	Castaic-Balcom silty clay loams, 30 to 50 percent slopes	19	-----	--	VIe-1 (19)	89	1	107	A	5	1
CmF2	Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded	18	-----	--	VIe-1 (19)	89	1	107	A	5	1
CmG2	Castaic-Balcom silty clay loams, 50 to 65 percent slopes, eroded	19	-----	--	VIIe-1 (19)	89	1	107	J	5	6
CnG3	Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded	19	-----	--	VIIIe-1 (19, 20, 30)	91	----	107	J	5	6
Co	Chino loam	20	IIw-2 (19)	84	-----	--	5	108	E	3	3
CyA	Cortina sandy loam, 0 to 2 percent slopes	21	IVs-0 (19)	88	-----	--	3	107	B	2	2
CyC	Cortina sandy loam, 2 to 9 percent slopes	21	IVs-0 (19)	88	-----	--	3	107	B	2	2
CzC	Cortina cobbly sandy loam, 2 to 9 percent slopes	21	-----	--	VIIs-7 (19)	91	3	107	J	5	2
DuD	Dune land	21	-----	--	VIIIe-4 (20, 30)	91	---	---	J	5	6
GaE2	Gaviota rocky sandy loam, 15 to 30 percent slopes, eroded	22	-----	--	VIIe-1 (19)	89	4	108	J	5	4
GaF2	Gaviota rocky sandy loam, 30 to 50 percent slopes, eroded	22	-----	--	VIIe-1 (19)	89	4	108	J	5	4
GbF	Gazos clay loam, 30 to 50 percent slopes	22	-----	--	VIe-1 (19)	89	1	107	G	5	4
GcE	Godde loam, 15 to 30 percent slopes	23	-----	--	VIe-1 (20)	89	4	108	G	5	4
GdF	Godde rocky loam, 30 to 50 percent slopes	23	-----	--	VIIe-1 (20)	89	4	108	J	5	4
GoD	Gorman sandy loam, 9 to 15 percent slopes	25	-----	--	IVe-1 (20)	87	2	107	A	1	1
GoD2	Gorman sandy loam, 9 to 15 percent slopes, eroded	25	-----	--	IVe-1 (20)	87	2	107	A	1	1
GoE2	Gorman sandy loam, 15 to 30 percent slopes, eroded	24	-----	--	VIe-1 (20)	89	2	107	A	1	1
GoF2	Gorman sandy loam, 30 to 50 percent slopes, eroded	25	-----	--	VIIe-1 (20)	89	2	107	J	5	5
GsA	Greenfield sandy loam, 0 to 2 percent slopes	26	I-1 (19)	82	IVec-1 (19)	88	2	107	A	1	1
GsC	Greenfield sandy loam, 2 to 9 percent slopes	25	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
GsC2	Greenfield sandy loam, 2 to 9 percent slopes, eroded	26	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
GsD2	Greenfield sandy loam, 9 to 15 percent slopes, eroded	26	IIIe-1 (19)	85	IVec-1 (19)	88	2	107	A	1	1

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Map symbol	Mapping unit	Described on page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Range site Number	Range site Page	Vegetative soil group	Windbreak group	Wildlife group
GuF	Gullied land	26	-----	--	VIIIe-1 (19, 20, 30)	91	---	---	J	5	6
HaB2	Hanford loamy sand, 2 to 5 percent slopes, hummocky	27	-----	--	IVec-1 (19)	88	3	107	B	2	2
HbA	Hanford coarse sandy loam, 0 to 2 percent slopes	27	IIs-4 (19)	85	IVec-1 (19)	88	2	107	A	1	1
HbC	Hanford coarse sandy loam, 2 to 9 percent slopes	27	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
HbD	Hanford coarse sandy loam, 9 to 15 percent slopes	27	IIIe-1 (19)	85	IVec-1 (19)	88	2	107	A	1	1
HcA	Hanford sandy loam, 0 to 2 percent slopes	27	IIs-4 (19)	85	IVec-1 (19)	88	2	107	A	1	1
HcC	Hanford sandy loam, 2 to 9 percent slopes	28	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
HdC	Hanford gravelly sandy loam, 2 to 9 percent slopes	28	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	2
HeC	Hanford sandy loam, calcareous variant, 2 to 9 percent slopes	28	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
HfA	Hanford loam, 0 to 2 percent slopes	28	I-1 (19)	82	IVec-1 (19)	88	2	107	A	1	1
HgA	Hesperia loamy fine sand, 0 to 2 percent slopes	30	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	B	2	2
HgA2	Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky	30	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	B	2	2
HgB	Hesperia loamy fine sand, 2 to 5 percent slopes	30	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	B	2	2
HkA	Hesperia fine sandy loam, 0 to 2 percent slopes	30	IIe-4 (30)	84	VIIe-1 (30)	90	7	109	A	1	1
HkB	Hesperia fine sandy loam, 2 to 5 percent slopes	29	IIe-1 (30)	83	VIIe-1 (30)	90	7	109	A	1	1
HmA	Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes	30	IIe-1 (30)	83	VIIe-1 (30)	90	7	109	A	1	1
HnA	Hesperia loam, 0 to 2 percent slopes	30	I-1 (30)	83	VIIc-1 (30)	91	7	109	A	1	1
LaE	Las Posas loam, 9 to 30 percent slopes	32	IVe-1 (19)	87	-----	--	2	107	A	1	1
LdF	Las Posas-Toomes rocky loams, 30 to 50 percent slopes	32									
	Las Posas part	--	-----	--	VIIe-1 (19)	89	2	107	J	1	1
	Toomes part	--	-----	--	VIIe-1 (19)	89	2	107	J	5	4
LeF	Lebec rocky loam, 15 to 50 percent slopes	32	-----	--	VIe-1 (20)	89	2	107	J	5	5
Me	Merrill sandy loam	33	IIIe-8 (30)	86	VIIe-1 (30)	90	6	108	G	4	3
MfA	Metz loamy sand, 0 to 2 percent slopes	34	IIIs-4 (19)	86	-----	--	---	---	B	2	2
MfC	Metz loamy sand, 2 to 9 percent slopes	35	IIIs-4 (19)	86	-----	--	---	---	B	2	2
MgA	Metz loam, 0 to 2 percent slopes	35	IIs-4 (19)	85	-----	--	---	---	A	1	1
MgB	Metz loam, 2 to 5 percent slopes	35	IIs-4 (19)	85	-----	--	---	---	A	1	1
MhE2	Millsholm rocky loam, 15 to 30 percent slopes, eroded	36	-----	--	VIIe-1 (19)	89	4	108	J	5	4
MhF2	Millsholm rocky loam, 30 to 50 percent slopes, eroded	35	-----	--	VIIe-1 (19)	89	4	108	J	5	4
MoA	Mocho sandy loam, 0 to 2 percent slopes	37	I-1 (19)	82	-----	--	---	---	A	1	1
MpA	Mocho loam, 0 to 2 percent slopes	36	I-1 (19)	82	-----	--	---	---	A	1	1
MpC	Mocho loam, 2 to 9 percent slopes	37	IIe-1 (19)	83	-----	--	---	---	A	1	1
MsB	Mohave coarse sandy loam, 2 to 5 percent slopes	37	IIe-1 (30)	83	VIIe-1 (30)	90	7	109	A	1	1
OaC	Oakdale sandy loam, 2 to 9 percent slopes	38	-----	--	IVec-1 (19)	88	2	107	A	1	1
ObA	Oak Glen sandy loam, 0 to 2 percent slopes	40	-----	--	IIIc-1 (20)	87	2	107	A	1	5
ObC	Oak Glen sandy loam, 2 to 9 percent slopes	39	-----	--	IIIe-1 (20)	85	2	107	A	1	5
OcC	Oak Glen gravelly sandy loam, 2 to 9 percent slopes	40	-----	--	IIIe-1 (20)	85	2	107	A	2	2
OdA	Oak Glen loam, 0 to 2 percent slopes	40	-----	--	IIIc-1 (20)	85	2	107	A	1	5
OdC	Oak Glen loam, 2 to 9 percent slopes	40	-----	--	IIIe-1 (20)	85	2	107	A	1	5
OgC	Ojai loam, 2 to 9 percent slopes	42	IIIe-1 (19)	85	-----	--	2	107	A	1	1
OgD	Ojai loam, 9 to 15 percent slopes	43	IVe-1 (19)	87	-----	--	2	107	A	1	1
OgE	Ojai loam, 15 to 30 percent slopes	43	-----	--	VIe-1 (19)	89	2	107	A	1	1
OgF	Ojai loam, 30 to 50 percent slopes	43	-----	--	VIIe-1 (19)	89	2	107	J	5	1
OgF2	Ojai loam, 30 to 50 percent slopes, eroded	43	-----	--	VIIe-1 (19)	89	2	107	J	5	1
OhF	Ojai loam, thin surface variant, 30 to 50 percent slopes	43	-----	--	VIIe-1 (19)	89	2	107	J	5	1
OzE	Ojai-Zamora loams, 15 to 30 percent slopes	43	-----	--	VIe-1 (19)	89	2	107	A	1	1
Po	Pond loam	44	-----	--	VIIs-6 (30)	90	6	108	F	3	3
Ps	Pond silty clay loam	45	-----	--	VIIs-6 (30)	90	6	108	F	3	3
Px	Pond-Oban complex	45	-----	--	VIIs-6 (30)	90	6	108	F	3	3
RcA	Ramona coarse sandy loam, 0 to 2 percent slopes	47	I-1 (19)	82	IVec-1 (19)	88	2	107	A	1	1
RcB	Ramona coarse sandy loam, 2 to 5 percent slopes	47	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
RcC	Ramona coarse sandy loam, 5 to 9 percent slopes	46	IIIe-1 (19)	85	IVec-1 (19)	88	2	107	A	1	1
RcD	Ramona coarse sandy loam, 9 to 15 percent slopes	47	IVe-1 (19)	87	IVec-1 (19)	88	2	107	A	1	1
RdE2	Ramona sandy loam, 9 to 30 percent slopes, eroded	47	-----	--	VIe-1 (19)	89	2	107	A	5	1
ReC	Ramona gravelly sandy loam, 2 to 9 percent slopes	47	IIIe-1 (19)	85	IVec-1 (19)	88	2	107	A	2	2
ReE	Ramona gravelly sandy loam, 9 to 30 percent slopes	47	-----	--	VIe-1 (19)	89	2	107	A	5	2

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Map symbol	Mapping unit	Described on page	Capability unit: Irrigated Symbol	Irrigated Page	Capability unit: Dryland Symbol	Dryland Page	Range site Number	Range site Page	Vegetative soil group	Windbreak group	Wildlife group
RfB	Ramona loam, 2 to 5 percent slopes	48	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
RfC	Ramona loam, 5 to 9 percent slopes	48	IIIe-1 (19)	85	IVec-1 (19)	88	2	107	A	1	1
Rg	Riverwash	48	-----	--	VIIIw-4 (19, 20, 30)	91	---	---	J	5	6
RhF	Rock land	48	-----	--	VIIIs-1 (19, 20, 30)	91	---	---	J	5	6
Rm	Rosamond loamy fine sand	49	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	A	2	2
Rm2	Rosamond loamy fine sand, hummocky	49	IIe-4 (30)	84	VIIe-4 (30)	90	8	109	A	2	2
Ro	Rosamond fine sandy loam	48	IIe-1 (30)	83	VIIe-1 (30)	90	7	109	A	1	1
Rp	Rosamond loam	49	I-1 (30)	83	VIIc-1 (30)	91	7	109	A	1	1
Rr	Rosamond loam, saline-alkali	50	IIIs-6 (30)	87	VIIs-6 (30)	90	6	108	F	3	3
Rs	Rosamond loam, sandy loam substratum	50	I-1 (30)	83	VIIc-1 (30)	91	7	109	A	1	1
Rt	Rosamond silty clay loam	50	I-1 (30)	83	VIIc-1 (30)	91	7	109	A	1	1
Ru	Rosamond silty clay loam, saline-alkali	50	IIIs-6 (30)	87	VIIs-6 (30)	90	6	108	F	3	3
RzF	Rough broken land	50	-----	--	VIIe-1 (19, 20, 30)	91	---	---	J	5	6
Sa	Sandy alluvial land	50	-----	--	VIIw-4 (19, 20, 30)	90	3	107	J	5	2
ScE	Saugus loam, 15 to 30 percent slopes	51	-----	--	VIe-1 (19)	89	2	107	A	1	1
ScF	Saugus loam, 30 to 50 percent slopes	52	-----	--	VIIe-1 (19)	89	2	107	J	5	1
ScF2	Saugus loam, 30 to 50 percent slopes, eroded	51	-----	--	VIIe-1 (19)	89	2	107	J	5	1
ShE	Sheridan sandy loam, 15 to 30 percent slopes	52	-----	--	VIe-1 (20)	89	2	107	G	5	5
ShE2	Sheridan sandy loam, 15 to 30 percent slopes, eroded	53	-----	--	VIe-1 (20)	89	2	107	G	5	5
ShF	Sheridan sandy loam, 30 to 50 percent slopes	52	-----	--	VIIe-1 (20)	89	2	107	J	5	5
ShF2	Sheridan sandy loam, 30 to 50 percent slopes, eroded	53	-----	--	VIIe-1 (20)	89	2	107	J	5	5
SoB	Soboba cobbly loamy sand, 2 to 5 percent slopes	53	-----	--	VIIs-4 (19)	90	3	107	J	5	2
SsA	Sorrento loam, 0 to 2 percent slopes	54	I-1 (19)	82	-----	--	---	---	A	1	1
SsB	Sorrento loam, 2 to 5 percent slopes	54	IIe-1 (19)	83	-----	--	---	---	A	1	1
Su	Sunrise loamy fine sand	56	IIIe-8 (30)	86	VIIe-4 (30)	90	6	108	G	4	2
Sv	Sunrise sandy loam	55	IIIe-8 (30)	86	VIIe-1 (30)	90	6	108	G	4	1
Sw	Sunrise sandy loam, shallow	55	IVe-8 (30)	88	VIIe-1 (30)	90	6	108	G	4	1
Sx	Sunrise loam	56	IIIe-8 (30)	86	VIIe-1 (30)	90	6	108	G	4	1
Sy	Sunrise loam, saline-alkali	56	IIIe-8 (30)	86	VIIs-6 (30)	90	6	108	F	3	3
TrF	Temescal-Rock land complex, 30 to 50 percent slopes	56									
	Temescal part		-----	--	VIIe-1 (19)	89	4	108	J	5	4
	Rock land part		-----	--	VIIIs-1 (19)	91	---	---	J	5	4
TsF	Terrace escarpments	57	-----	--	VIIe-1 (19), VIIe-1 (20)	89	2	107	J	5	6
Tt2	Tray fine sand, hummocky	58	IIIe-4 (30)	85	VIIe-4 (30)	90	6	108	B	2	2
Tu	Tray sandy loam	58	IIe-1 (30)	83	VIIe-1 (30)	90	6	108	A	1	1
Tv	Tray sandy loam, saline-alkali	58	IIIs-6 (30)	87	VIIs-6 (30)	90	6	108	F	3	3
Tw	Tray loam, saline-alkali	59	IIIs-6 (30)	87	VIIs-6 (30)	90	6	108	F	3	3
VaA	Vernalis sandy loam, 0 to 2 percent slopes	60	I-1 (19)	82	IVec-1 (19)	88	2	107	A	1	1
VbA	Vernalis loam, 0 to 2 percent slopes	59	I-1 (19)	82	IVec-1 (19)	88	2	107	A	1	1
VbB	Vernalis loam, 2 to 5 percent slopes	60	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
VcA	Vernalis clay loam, 0 to 2 percent slopes	60	I-1 (19)	82	IVec-1 (19)	88	1	107	A	1	1
VsD2	Vista coarse sandy loam, 9 to 15 percent slopes, eroded	61	IVe-1 (19)	87	-----	--	2	107	G	5	1
VsE	Vista coarse sandy loam, 15 to 30 percent slopes	61	-----	--	VIe-1 (19)	89	2	107	G	5	1
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, eroded	61	-----	--	VIe-1 (19)	89	2	107	G	5	1
VsF	Vista coarse sandy loam, 30 to 50 percent slopes	60	-----	--	VIIe-1 (19)	89	2	107	J	5	1
VsF2	Vista coarse sandy loam, 30 to 50 percent slopes, eroded	61	-----	--	VIIe-1 (19)	89	2	107	J	5	1
WgC	Wyman gravelly loam, 2 to 9 percent slopes	61	IIe-1 (19)	83	IVec-1 (19)	88	2	107	A	1	1
WgD	Wyman gravelly loam, 9 to 15 percent slopes	62	IIIe-1 (19)	85	IVec-1 (19)	88	2	107	A	1	1
WoC	Wyman cobbly loam, 5 to 9 percent slopes	62	-----	--	VIe-7 (19)	89	2	107	A	5	2
YoA	Yolo loam, 0 to 2 percent slopes	63	I-1 (19)	82	-----	--	---	---	A	1	1
YoC	Yolo loam, 2 to 9 percent slopes	63	IIe-1 (19)	83	-----	--	2	107	A	1	1
ZaC	Zamora loam, 2 to 9 percent slopes	63	IIe-1 (19)	83	-----	--	2	107	A	1	1
ZaD	Zamora loam, 9 to 15 percent slopes	64	IIIe-1 (19)	85	-----	--	2	107	A	1	1
ZcC	Zamora clay loam, 2 to 9 percent slopes	64	IIe-1 (19)	83	-----	--	1	107	A	1	1

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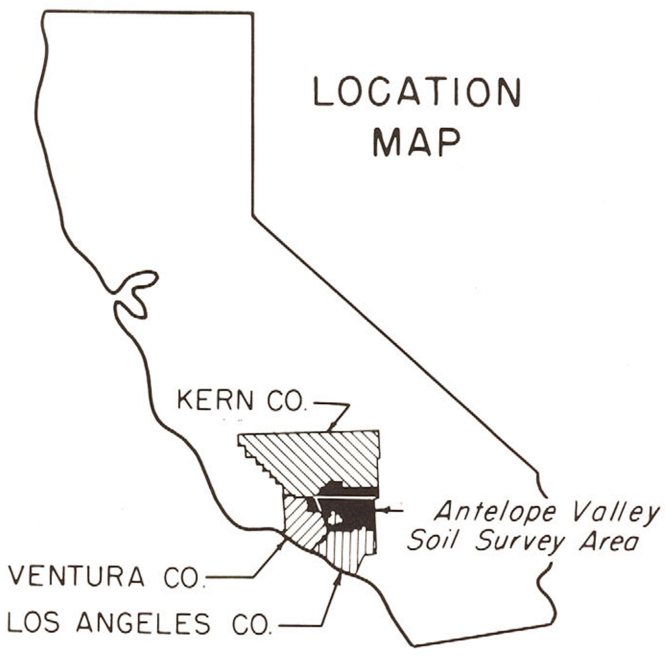
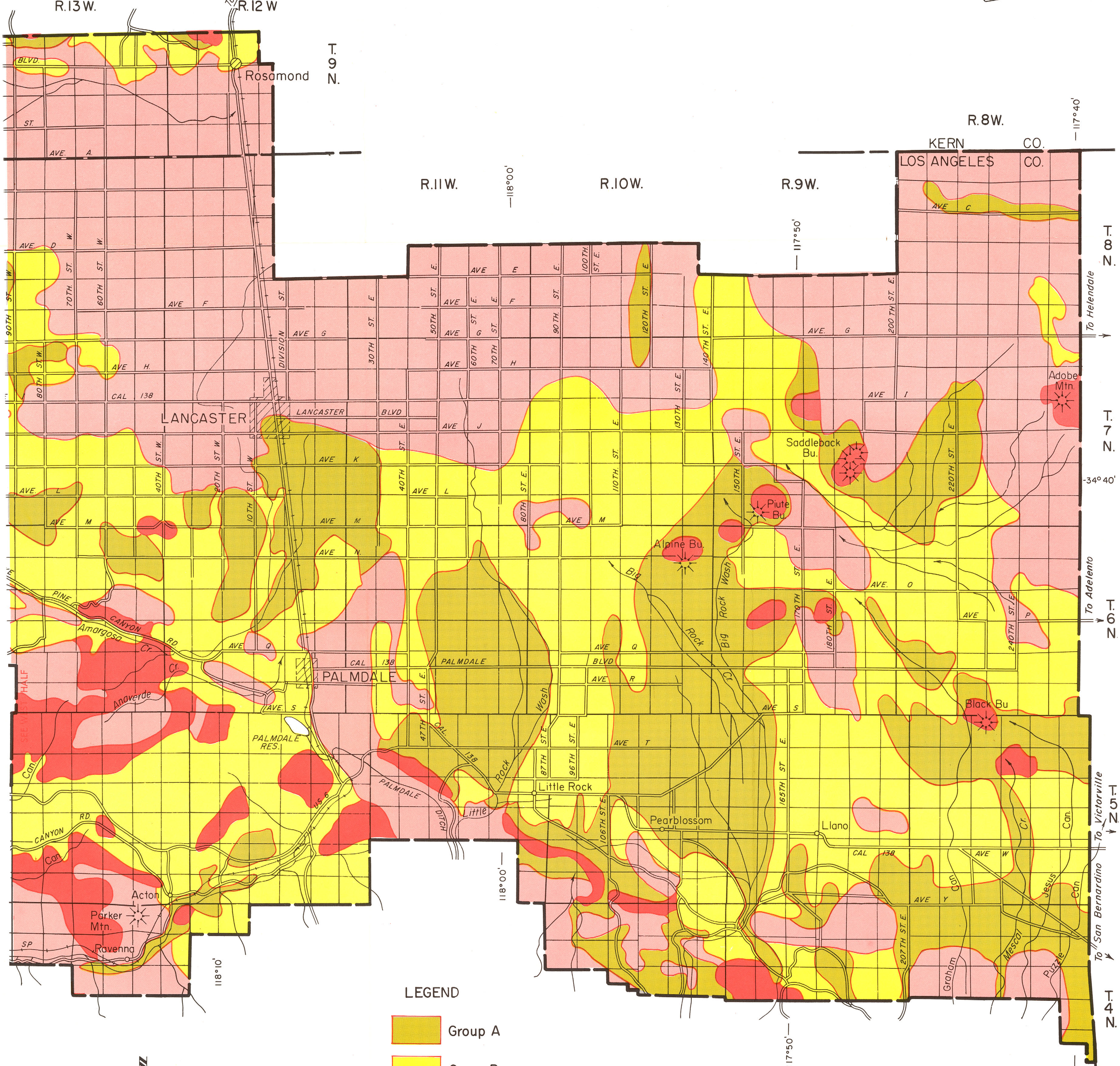
HYDROLOGIC SOIL GROUPS
East Half
ANTELOPE VALLEY AREA
CALIFORNIA

AUGUST 1969

2 0 2 4 6
SCALE IN MILES
SCALE 1:126,720





LEGEND

- Group A
- Group B
- Group C
- Group D

For definitions see discussion of Engineering Interpretations in the section on Engineering Uses of the Soils in the Soil Survey of the Antelope Valley Area, California.

This map was prepared from detailed soil maps and generalized to the scale of 2 miles equals one inch.

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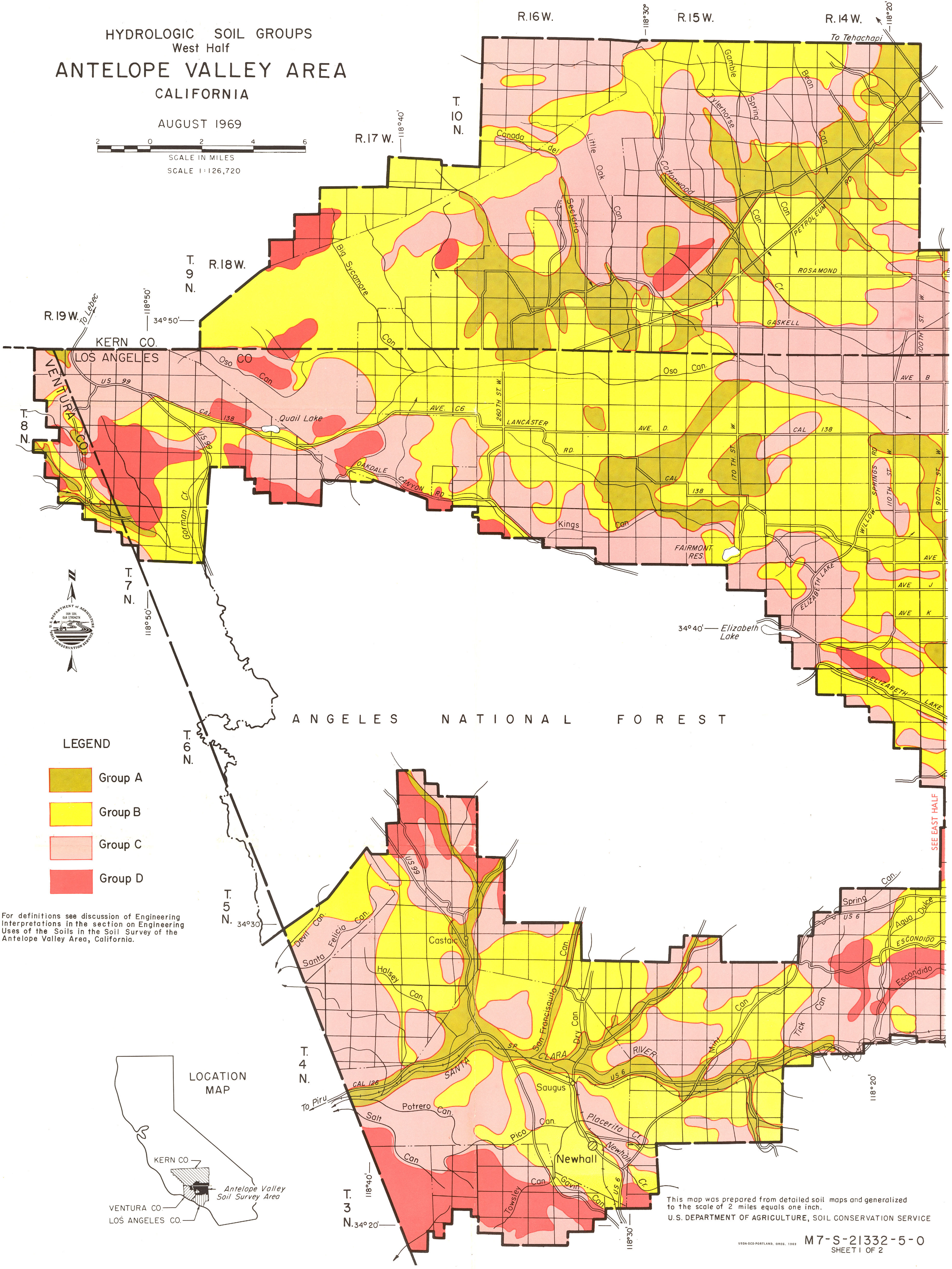
USDA-SCS-PORTLAND, OREG. 1969
M7-S-21332-5-0
SHEET 2 OF 2


HYDROLOGIC SOIL GROUPS
West Half
ANTELOPE VALLEY AREA
CALIFORNIA
AUGUST 1969
SCALE IN MILES
SCALE 1:126,720
LEGEND
Group A
Group B
Group C
Group D
For definitions see discussion of Engineering Interpretations in the section on Engineering Uses of the Soils in the Soil Survey of the Antelope Valley Area, California.
LOCATION MAP
KERN CO.
VENTURA CO
LOS ANGELES CO.
Antelope Valley Soil Survey Area
ANGELES NATIONAL FOREST
KERN CO.
LOS ANGELES CO
VENTURA CO.
R.19 W.
R.18 W.
R.17 W.
R.16 W.
R.15 W.
R.14 W.
T. 10 N.
T. 9 N.
T. 8 N.
T. 7 N.
T. 6 N.
T. 5 N.
T. 4 N.
T. 3 N.
To Tehachapi
To Lebec
To Piru
Quail Lake
FAIRMONT RES
Elizabeth Lake
Castaic
Saugus
Newhall
SEE EAST HALF
This map was prepared from detailed soil maps and generalized to the scale of 2 miles equals one inch.
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USDA-SCS-PORTLAND, OREG. 1969
M7-S-21332-5-0
SHEET 1 OF 2

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Divided
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (Fy)
- Ford (Ford)
- Grade
- R. R. over
- R. R. under
- Tunnel (Tunnel)

Buildings
- School
- Church

Mine and quarry

Pit, gravel

Power line

Pipeline

Cemetery

Dams

Levee

Well, oil or gas

BOUNDARIES

- National or state
- County
- Project area
- Reservation
- Land grant
- Small park, cemetery, airport
- Land division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches (CANAL)

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Alluvial fan

Drainage end

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stony Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Sandy areas
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully
- Kitchen midden
- Landslide or slip
- Detrimental deposit
- Soil sample site

RELIEF

Escarpments
- Bedrock
- Other

Prominent peak

Depressions, unclassified (Large, Small)

SOIL LEGEND

Each symbol consists of letters or a combination of letters and numbers. The first capital letter is the initial one of the soil name. A second capital letter, if used, shows the class of slope. Symbols without a slope letter are for nearly level soils. A final number, 2 or 3, in a symbol indicates that the soil has been eroded or severely eroded by water or wind.

SYMBOL	NAME
AaB	Adelanto loamy sand, 2 to 5 percent slopes
AcA	Adelanto coarse sandy loam, 0 to 2 percent slopes
AdB	Adelanto gravelly sandy loam, 2 to 5 percent slopes
AgF	Agua Dulce stony loam, 30 to 50 percent slopes
AmF2	Amargosa rocky coarse sandy loam, 9 to 55 percent slopes, eroded
AnE	Anaverde loam, 15 to 30 percent slopes
ApF	Anaverde rocky loam, 30 to 50 percent slopes
AsB	Arizo gravelly loamy sand, 0 to 5 percent slopes
AtA	Arizo loamy fine sand, 0 to 2 percent slopes
AyD	Ayar clay loam, 5 to 15 percent slopes
CaA	Cajon loamy sand, 0 to 2 percent slopes
CaC	Cajon loamy sand, 2 to 9 percent slopes
CbA	Cajon loamy sand, loamy substratum, 0 to 2 percent slopes
CcA2	Cajon loamy fine sand, 0 to 2 percent slopes, hummocky
CcD2	Cajon loamy fine sand, 9 to 15 percent slopes, hummocky
ChC	Cálvista-Hi Vista complex, 2 to 9 percent slopes
ChE	Calvista-Hi Vista rocky complex, 9 to 30 percent slopes
CkC	Castaic silty clay loam, 2 to 9 percent slopes
CkD	Castaic silty clay loam, 9 to 15 percent slopes
CmD	Castaic-Balcom silty clay loams, 9 to 15 percent slopes
CmE	Castaic-Balcom silty clay loams, 15 to 30 percent slopes
CmF	Castaic-Balcom silty clay loams, 30 to 50 percent slopes
CmF2	Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded
CmG2	Castaic-Balcom silty clay loams, 50 to 65 percent slopes, eroded
CnG3	Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded
Co	Chino loam
CyA	Cortina sandy loam, 0 to 2 percent slopes
CyC	Cortina sandy loam, 2 to 9 percent slopes
CzC	Cortina cobbly sandy loam, 2 to 9 percent slopes
DuD	Dune land
GaE2	Gaviota rocky sandy loam, 15 to 30 percent slopes, eroded
GaF2	Gaviota rocky sandy loam, 30 to 50 percent slopes, eroded
GbF	Gazos clay loam, 30 to 50 percent slopes
GcE	Godde loam, 15 to 30 percent slopes
GdF	Godde rocky loam, 30 to 50 percent slopes
GoD	Gorman sandy loam, 9 to 15 percent slopes
GoD2	Gorman sandy loam, 9 to 15 percent slopes, eroded
GoE2	Gorman sandy loam, 15 to 30 percent slopes, eroded
GoF2	Gorman sandy loam, 30 to 50 percent slopes, eroded
GsA	Greenfield sandy loam, 0 to 2 percent slopes
GsC	Greenfield sandy loam, 2 to 9 percent slopes
GsC2	Greenfield sandy loam, 2 to 9 percent slopes, eroded
GsD2	Greenfield sandy loam, 9 to 15 percent slopes, eroded
GuF	Gullied land
HaB2	Hanford loamy sand, 2 to 5 percent slopes, hummocky
HbA	Hanford coarse sandy loam, 0 to 2 percent slopes
HbC	Hanford coarse sandy loam, 2 to 9 percent slopes
HbD	Hanford coarse sandy loam, 9 to 15 percent slopes
HcA	Hanford sandy loam, 0 to 2 percent slopes
HcC	Hanford sandy loam, 2 to 9 percent slopes
HdC	Hanford gravelly sandy loam, 2 to 9 percent slopes

SYMBOL	NAME
HeC	Hanford sandy loam, calcareous variant, 2 to 9 percent slopes
HfA	Hanford loam, 0 to 2 percent slopes
HgA	Hesperia loamy fine sand, 0 to 2 percent slopes
HgA2	Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky
HgB	Hesperia loamy fine sand, 2 to 5 percent slopes
HkA	Hesperia fine sandy loam, 0 to 2 percent slopes
HkB	Hesperia fine sandy loam, 2 to 5 percent slopes
HmA	Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes
HnA	Hesperia loam, 0 to 2 percent slopes
LaE	Las Posas loam, 9 to 30 percent slopes
LdF	Las Posas-Toomes rocky loams, 30 to 50 percent slopes
LeF	Lebec rocky loam, 15 to 50 percent slopes
Me	Merrill sandy loam
MfA	Metz loamy sand, 0 to 2 percent slopes
MfC	Metz loamy sand, 2 to 9 percent slopes
MgA	Metz loam, 0 to 2 percent slopes
MgB	Metz loam, 2 to 5 percent slopes
MhE2	Millsholm rocky loam, 15 to 30 percent slopes, eroded
MhF2	Millsholm rocky loam, 30 to 50 percent slopes, eroded
MoA	Mocho sandy loam, 0 to 2 percent slopes
MpA	Mocho loam, 0 to 2 percent slopes
MpC	Mocho loam, 2 to 9 percent slopes
MzB	Mohave coarse sandy loam, 2 to 5 percent slopes
OaC	Oakdale sandy loam, 2 to 9 percent slopes
ObA	Oak Glen sandy loam, 0 to 2 percent slopes
ObC	Oak Glen sandy loam, 2 to 9 percent slopes
OcC	Oak Glen gravelly sandy loam, 2 to 9 percent slopes
OdA	Oak Glen loam, 0 to 2 percent slopes
OdC	Oak Glen loam, 2 to 9 percent slopes
OgC	Ojai loam, 2 to 9 percent slopes
OgD	Ojai loam, 9 to 15 percent slopes
OgE	Ojai loam, 15 to 30 percent slopes
OgF	Ojai loam, 30 to 50 percent slopes
OgF2	Ojai loam, 30 to 50 percent slopes, eroded
OhF	Ojai loam, thin surface variant, 30 to 50 percent slopes
OzE	Ojai-Zamora loams, 15 to 30 percent slopes
Po	Pond loam
Ps	Pond silty clay loam
Px	Pond-Oban complex
RcA	Ramona coarse sandy loam, 0 to 2 percent slopes
RcB	Ramona coarse sandy loam, 2 to 5 percent slopes
RcC	Ramona coarse sandy loam, 5 to 9 percent slopes
RcD	Ramona coarse sandy loam, 9 to 15 percent slopes
RdE2	Ramona sandy loam, 9 to 30 percent slopes, eroded
ReC	Ramona gravelly sandy loam, 2 to 9 percent slopes
ReE	Ramona gravelly sandy loam, 9 to 30 percent slopes
RfB	Ramona loam, 2 to 5 percent slopes
RfC	Ramona loam, 5 to 9 percent slopes
Rg	Riverwash
RhF	Rock land

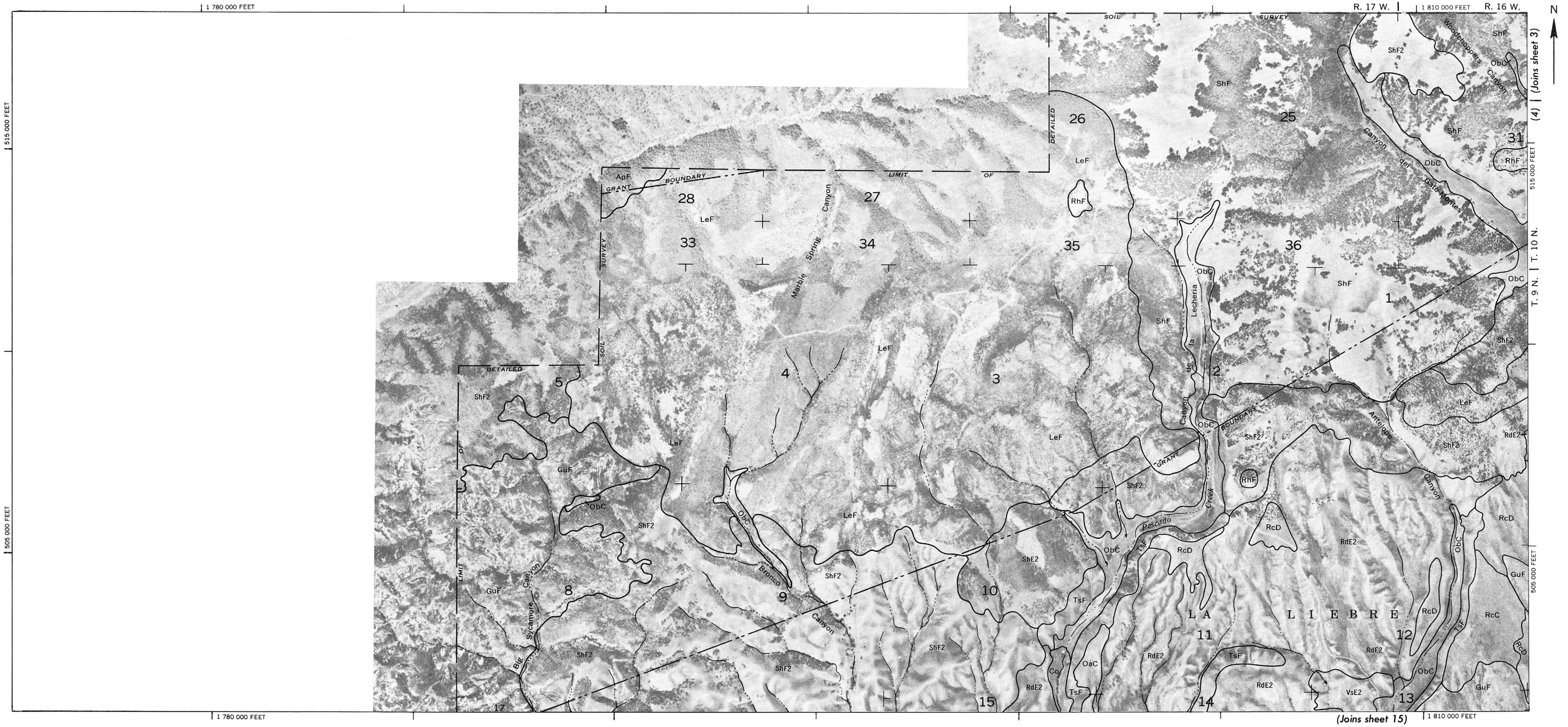
SYMBOL	NAME
Rm	Rosamond loamy fine sand
Rm2	Rosamond loamy fine sand, hummocky
Ro	Rosamond fine sandy loam
Rp	Rosamond loam
Rr	Rosamond loam, saline-alkali
Rs	Rosamond loam, sandy loam substratum
Rt	Rosamond silty clay loam
Ru	Rosamond silty clay loam, saline-alkali
RzF	Rough broken land
Sa	Sandy alluvial land
ScE	Saugus loam, 15 to 30 percent slopes
ScF	Saugus loam, 30 to 50 percent slopes
ScF2	Saugus loam, 30 to 50 percent slopes, eroded
ShE	Sheridan sandy loam, 15 to 30 percent slopes
ShE2	Sheridan sandy loam, 15 to 30 percent slopes, eroded
ShF	Sheridan sandy loam, 30 to 50 percent slopes
ShF2	Sheridan sandy loam, 30 to 50 percent slopes, eroded
SoB	Soboba cobbly loamy sand, 2 to 5 percent slopes
SsA	Sorrento loam, 0 to 2 percent slopes
SsB	Sorrento loam, 2 to 5 percent slopes
Su	Sunrise loamy fine sand
Sv	Sunrise sandy loam
Sw	Sunrise sandy loam, shallow
Sx	Sunrise loam
Sy	Sunrise loam, saline-alkali
TrF	Temescal-Rock land complex, 30 to 50 percent slopes
TsF	Terrace escarpments
Tt2	Tray fine sand, hummocky
Tu	Tray sandy loam
Tv	Tray sandy loam, saline-alkali
Tw	Tray loam, saline-alkali
VaA	Vernalis sandy loam, 0 to 2 percent slopes
VbA	Vernalis loam, 0 to 2 percent slopes
VbB	Vernalis loam, 2 to 5 percent slopes
VcA	Vernalis clay loam, 0 to 2 percent slopes
VsD2	Vista coarse sandy loam, 9 to 15 percent slopes, eroded
VsE	Vista coarse sandy loam, 15 to 30 percent slopes
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, eroded
VsF	Vista coarse sandy loam, 30 to 50 percent slopes
VsF2	Vista coarse sandy loam, 30 to 50 percent slopes, eroded
WgC	Wyman gravelly loam, 2 to 9 percent slopes
WgD	Wyman gravelly loam, 9 to 15 percent slopes
WoC	Wyman cobbly loam, 5 to 9 percent slopes
YoA	Yolo loam, 0 to 2 percent slopes
YoC	Yolo loam, 2 to 9 percent slopes
ZaC	Zamora loam, 2 to 9 percent slopes
ZaD	Zamora loam, 9 to 15 percent slopes
ZcC	Zamora clay loam, 2 to 9 percent slopes

Soil map constructed 1969 by Cartographic Division, Soil Conservation Service, USDA, from 1968 aerial photographs. Controlled mosaic based on California plane coordinate system, fifth and seventh zones, Lambert conformal conic projection, 1927 North American datum.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 1



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

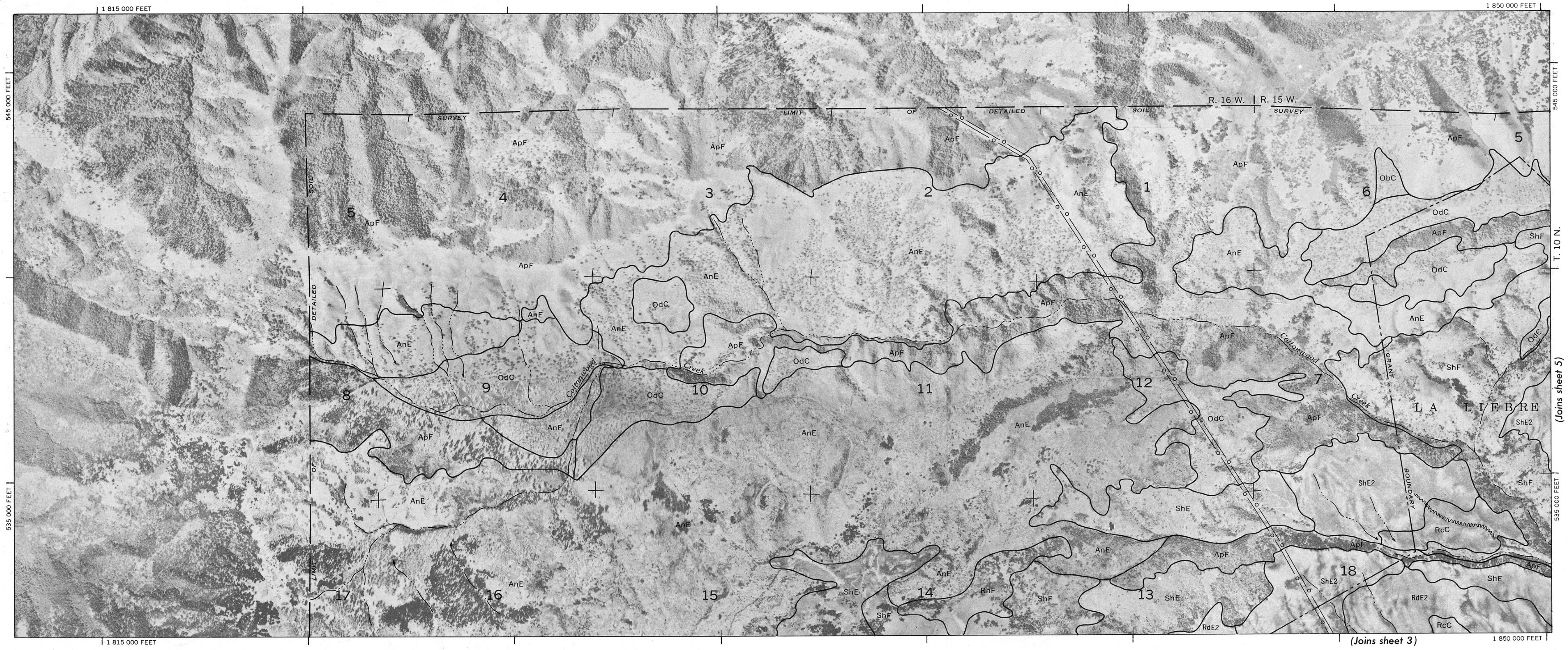
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 2

N



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 2

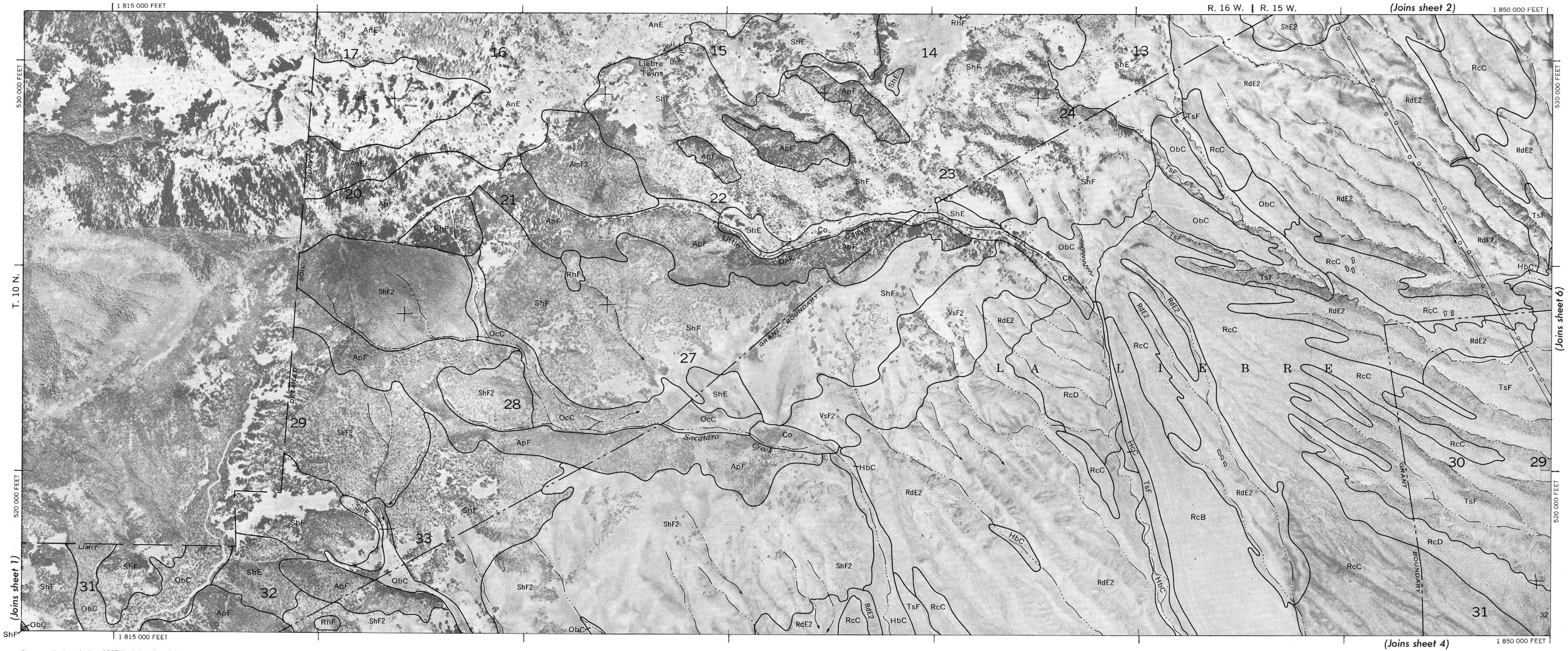
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 3

3

N



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

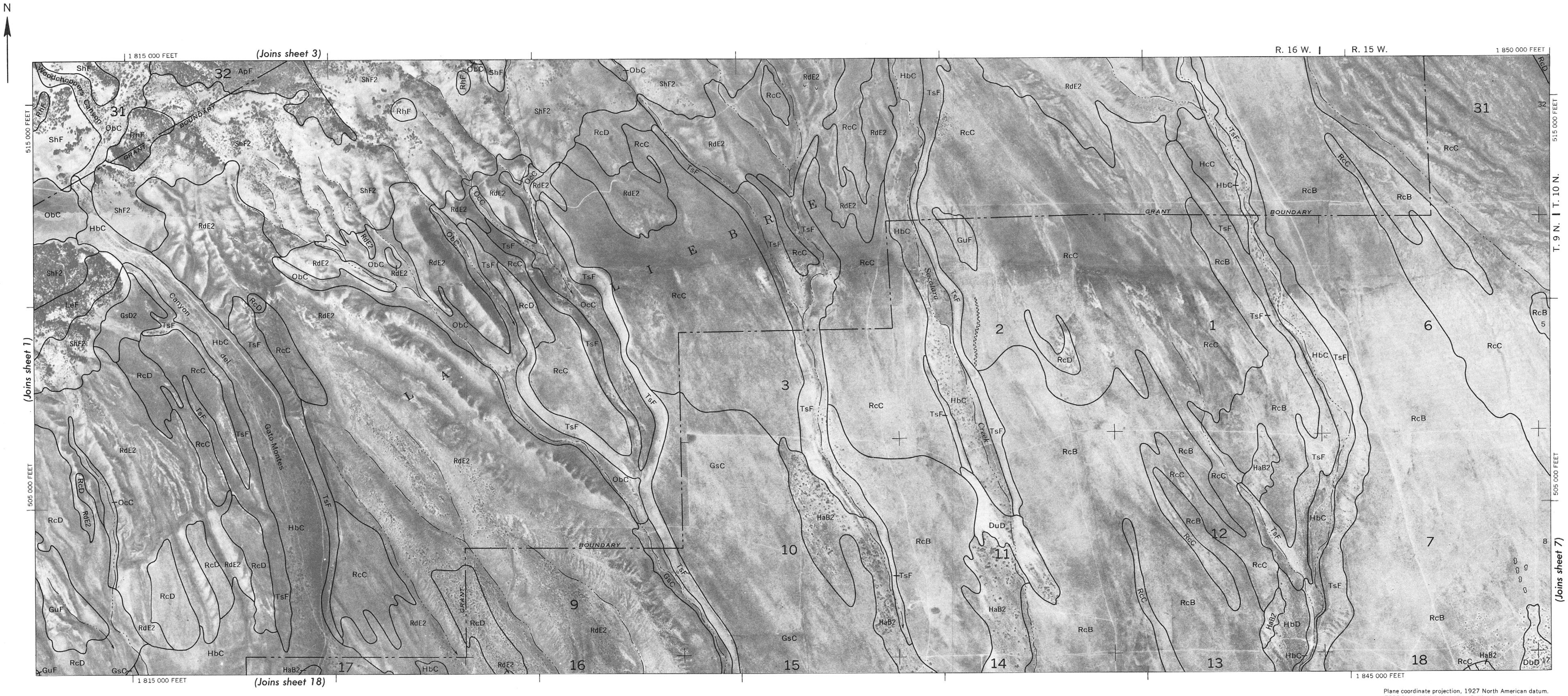
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 3



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 4

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

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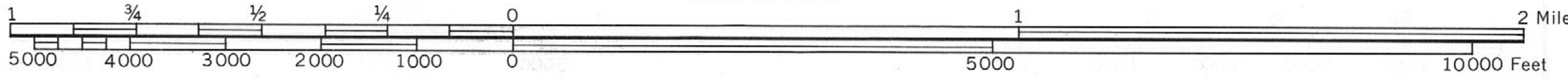
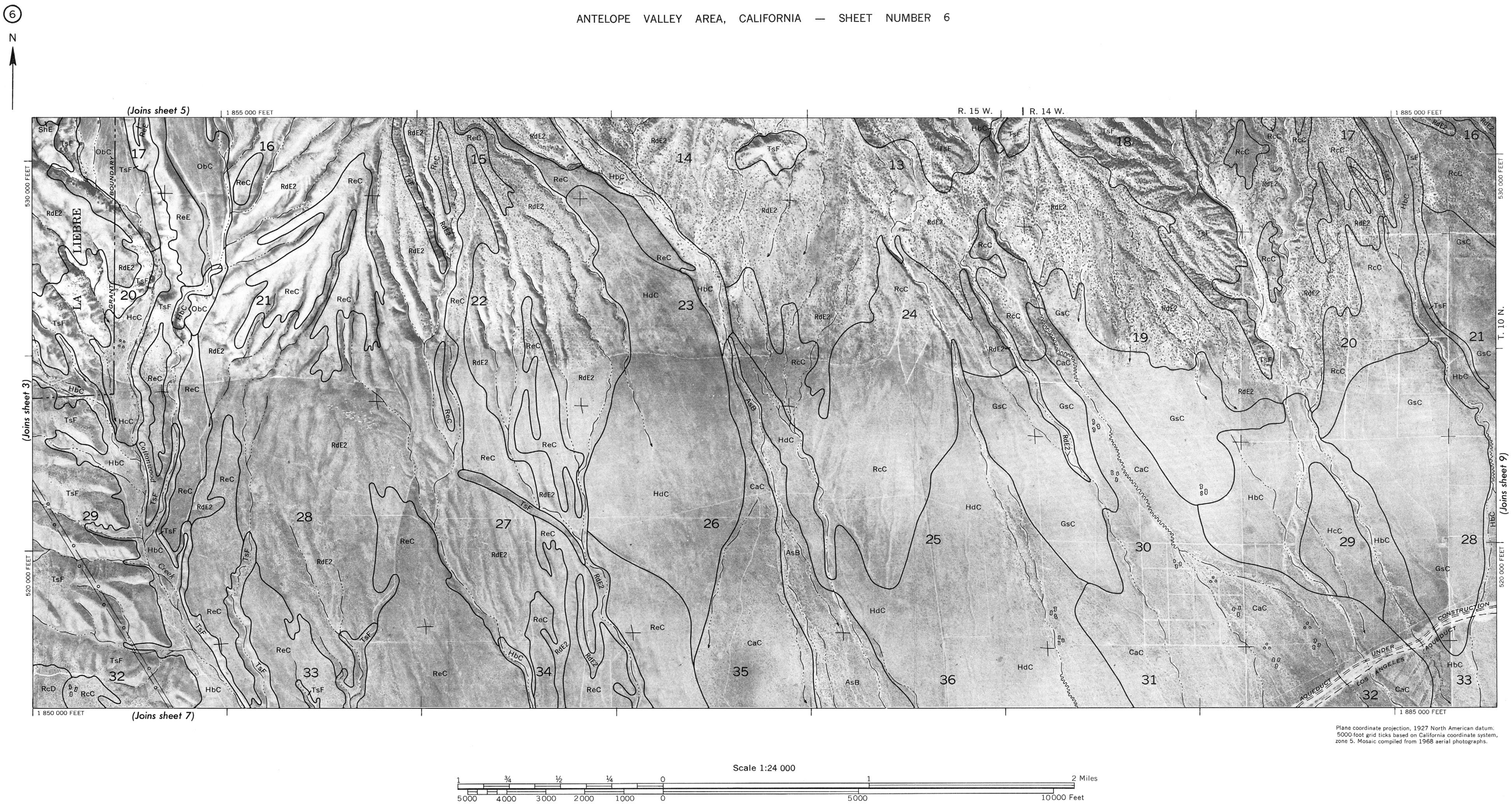
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 5

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000





Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 6

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 7

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

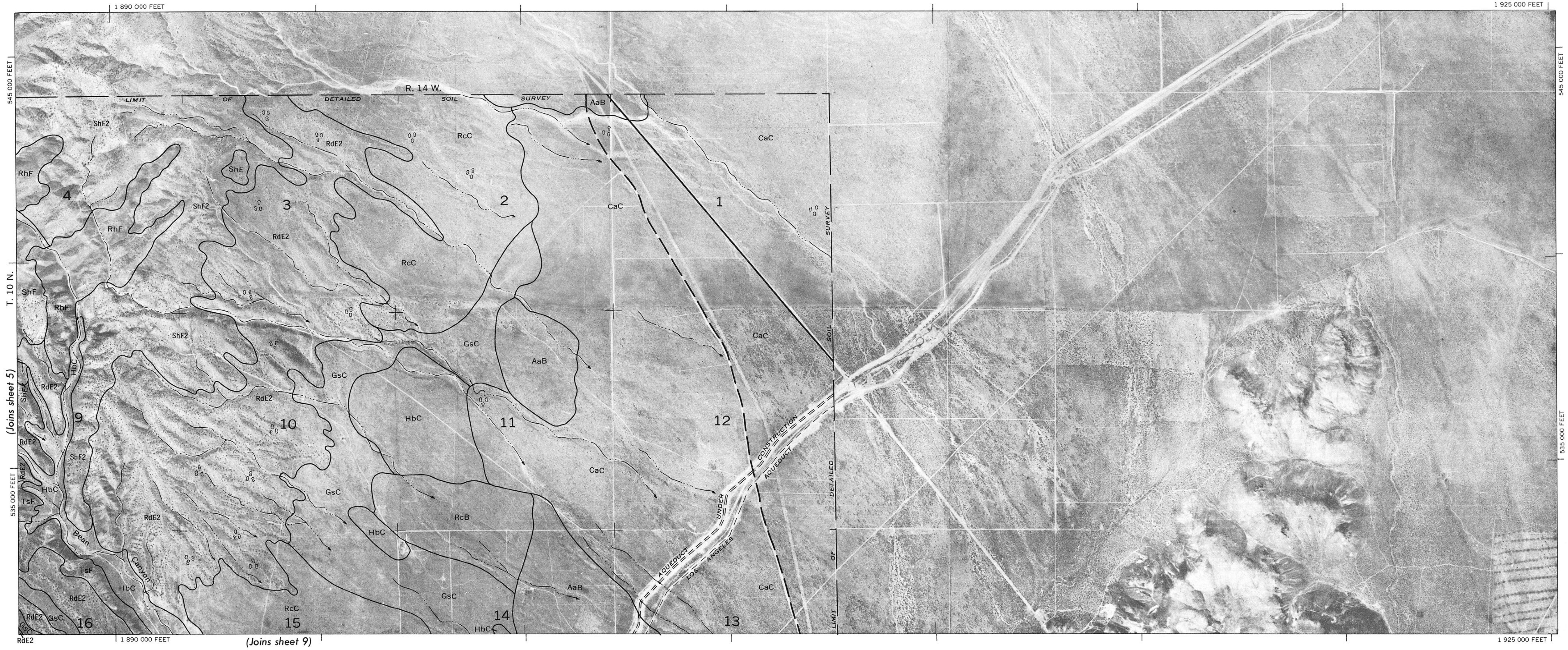
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

8

N



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 8

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Plane coordinate projection, 1927 North American datum. 5000 foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 9

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 10

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

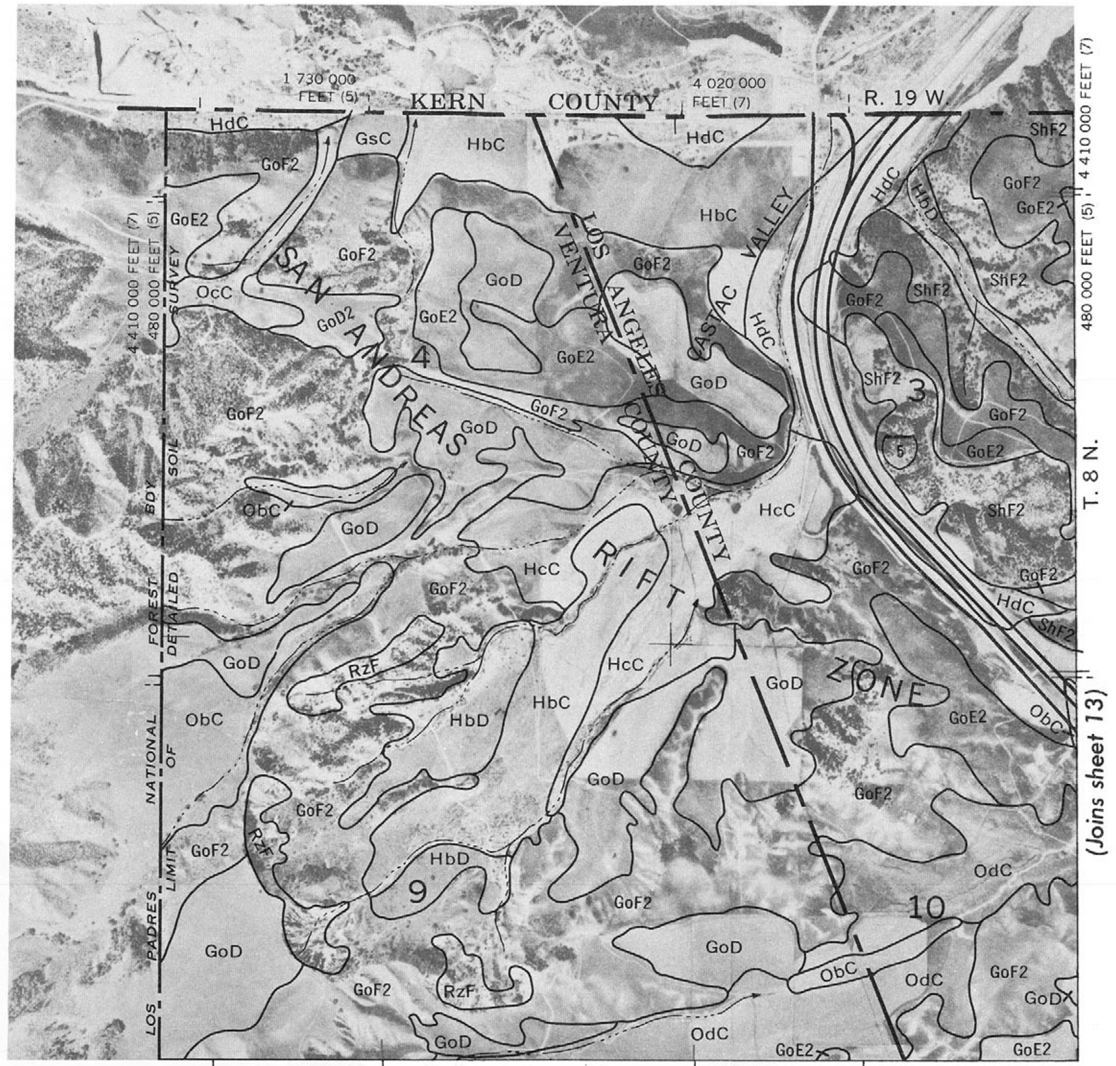
Land division corners are approximately positioned on this map.

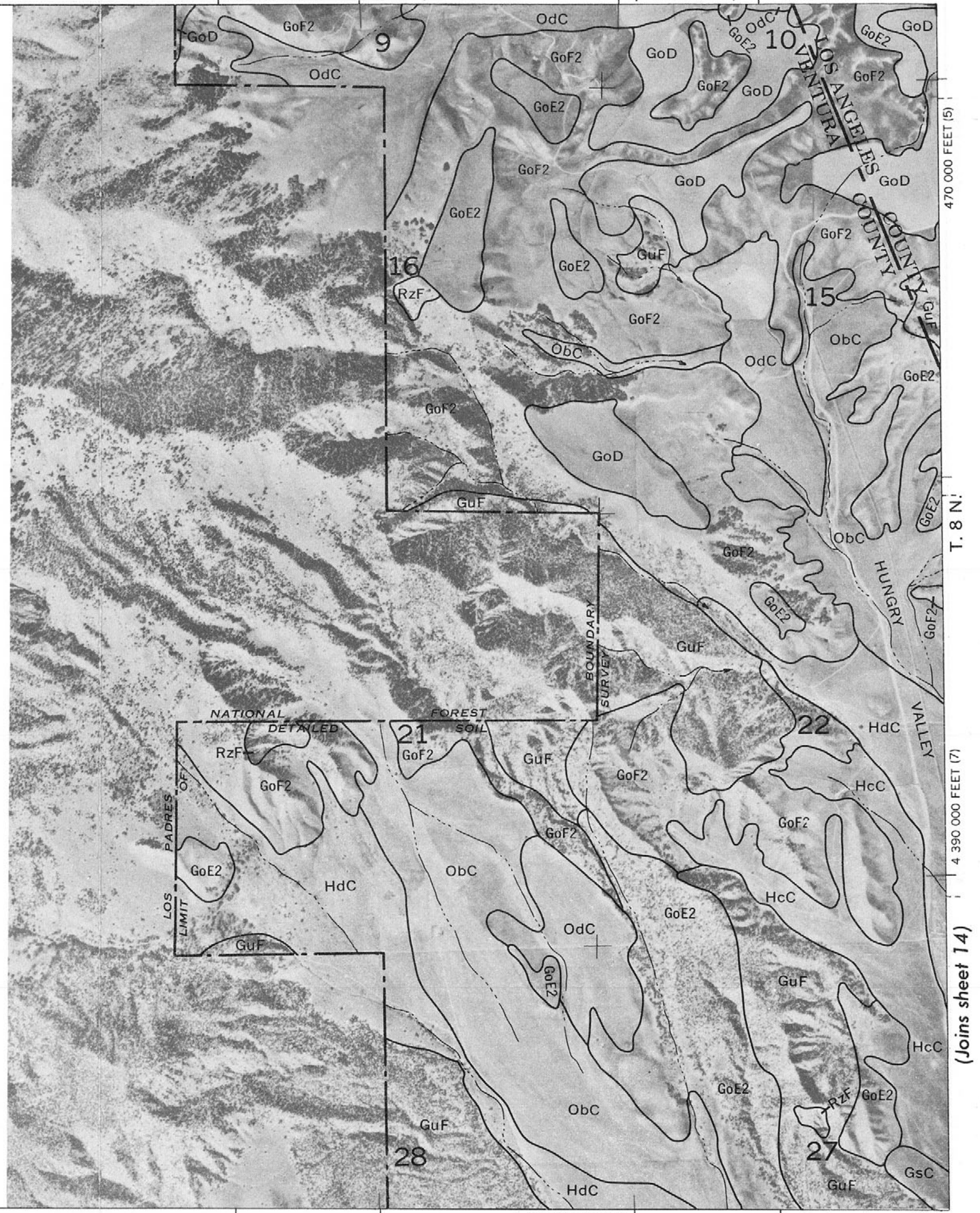
ANTELOPE VALLEY AREA, CALIFORNIA NO. 11

N

3 990 000 FEET (7)

4 400 000 FEET (7)





460 000 FEET (5)

1 700 000 FEET (5)

4 020 000 FEET (7)

(Joins sheet 35)

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

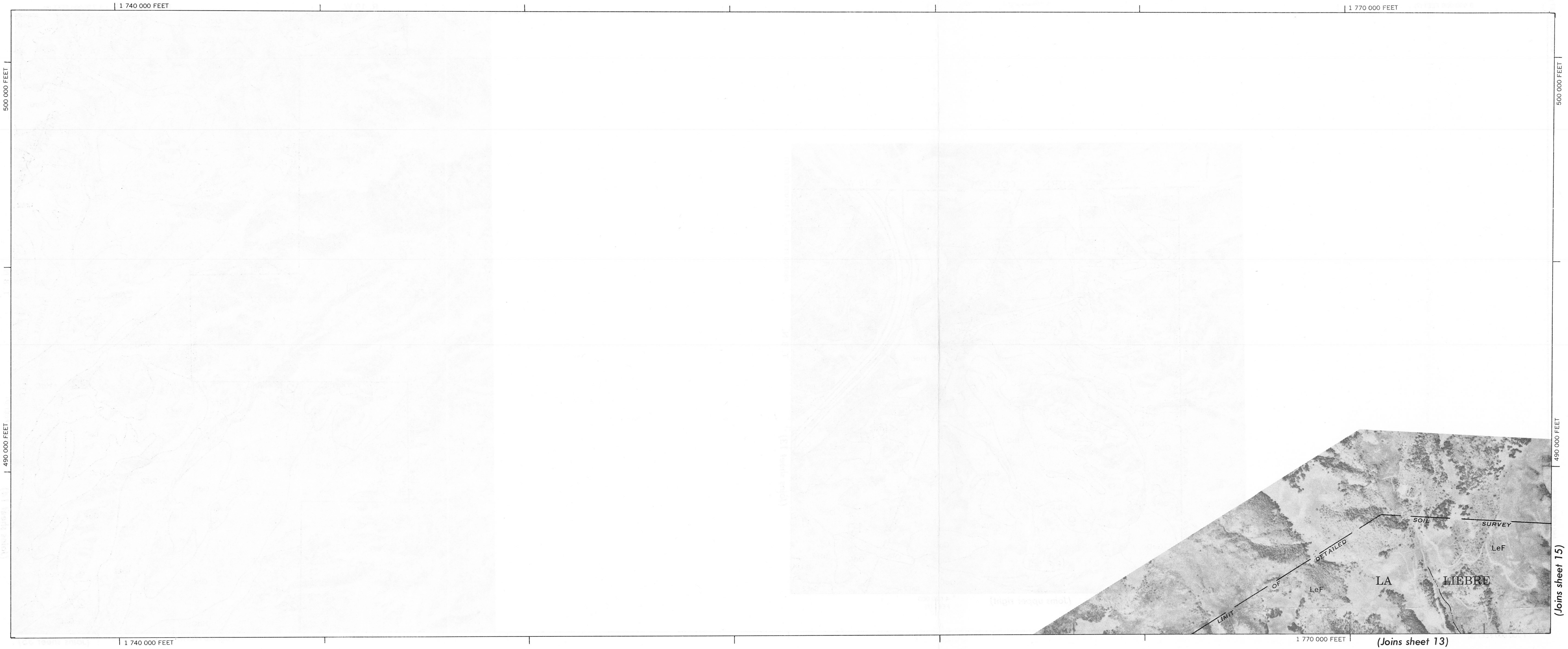
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 12

N



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 12

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

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Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 13

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 14

ANTELOPE VALLEY AREA, CALIFORNIA NO. 14

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

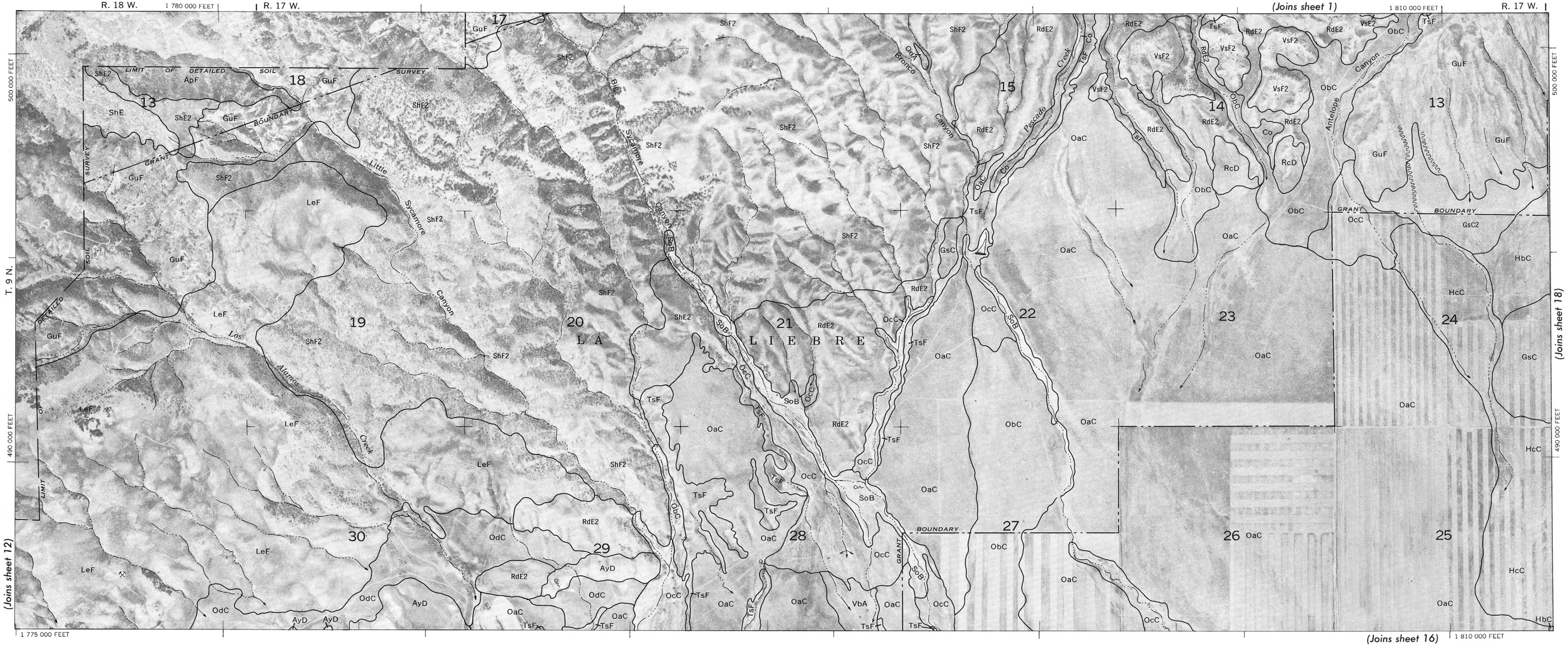
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 15

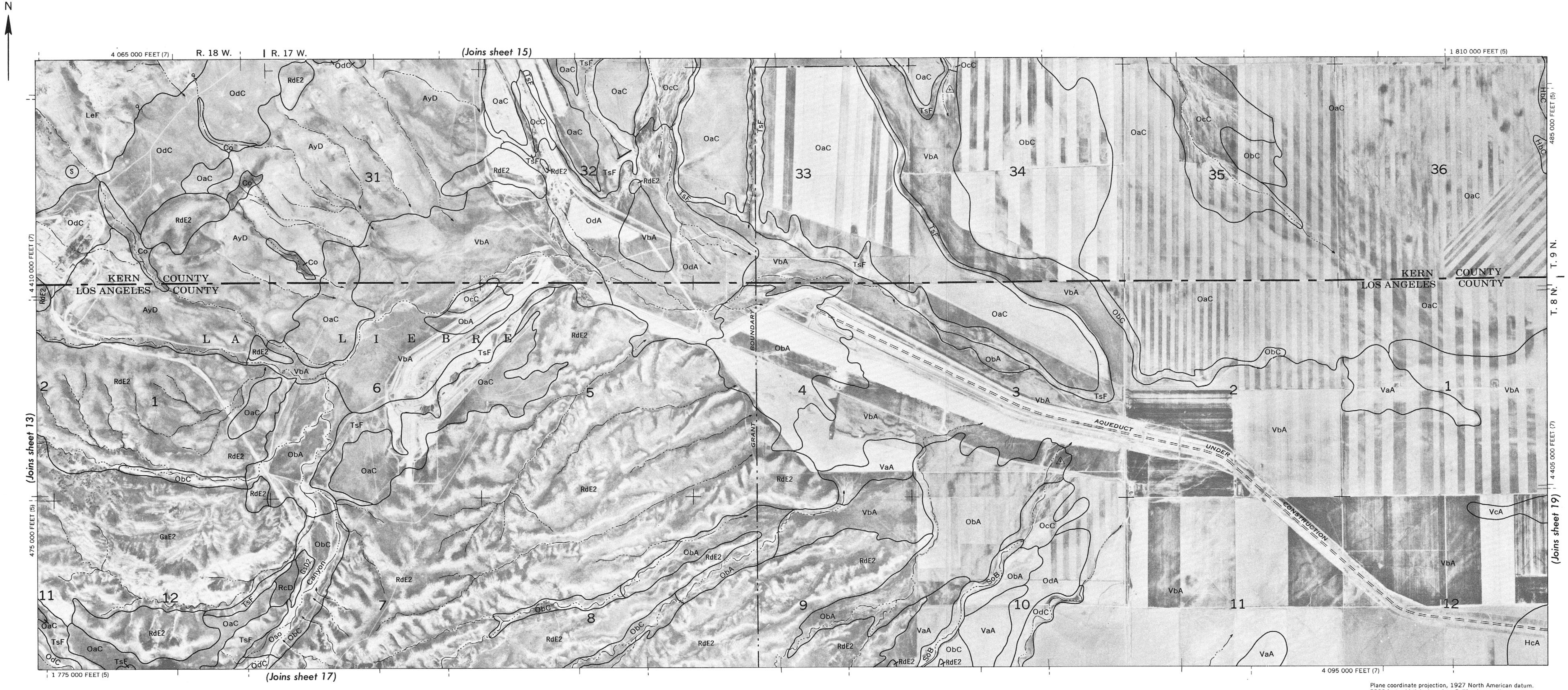


Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet



Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 16

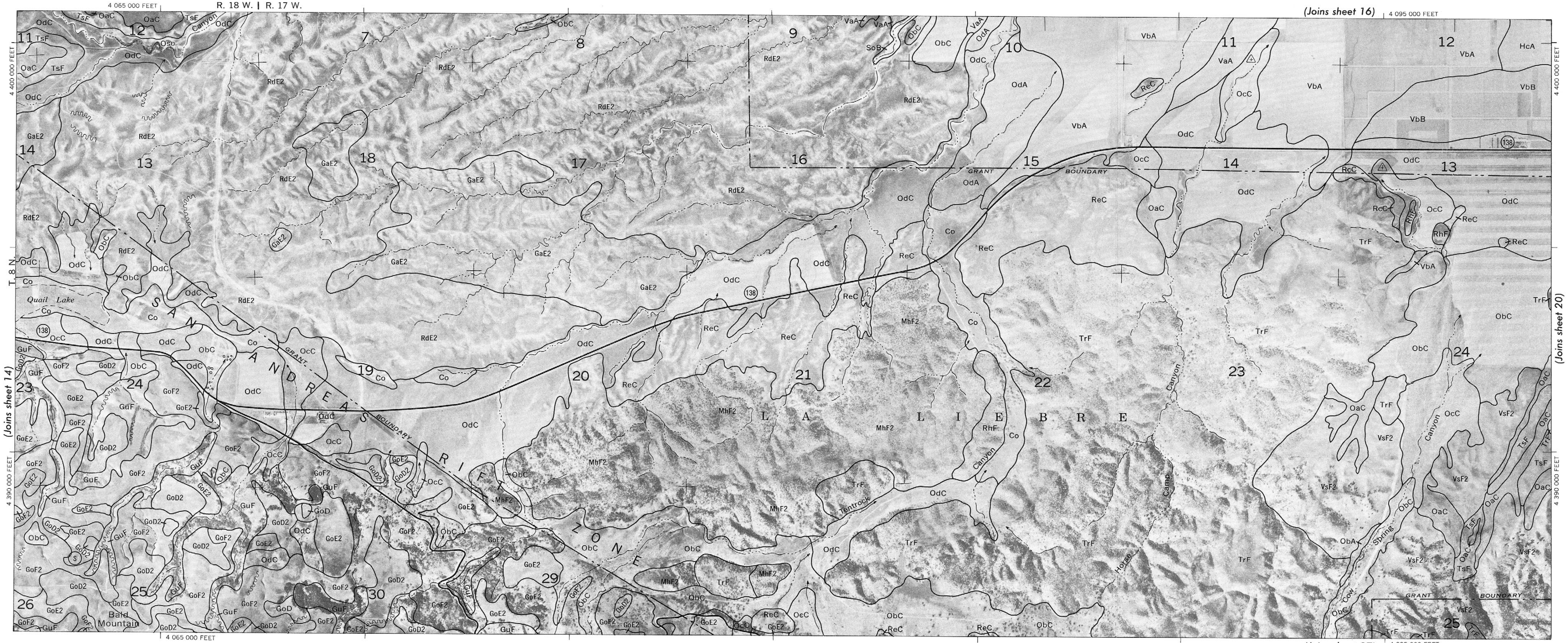
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

N



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

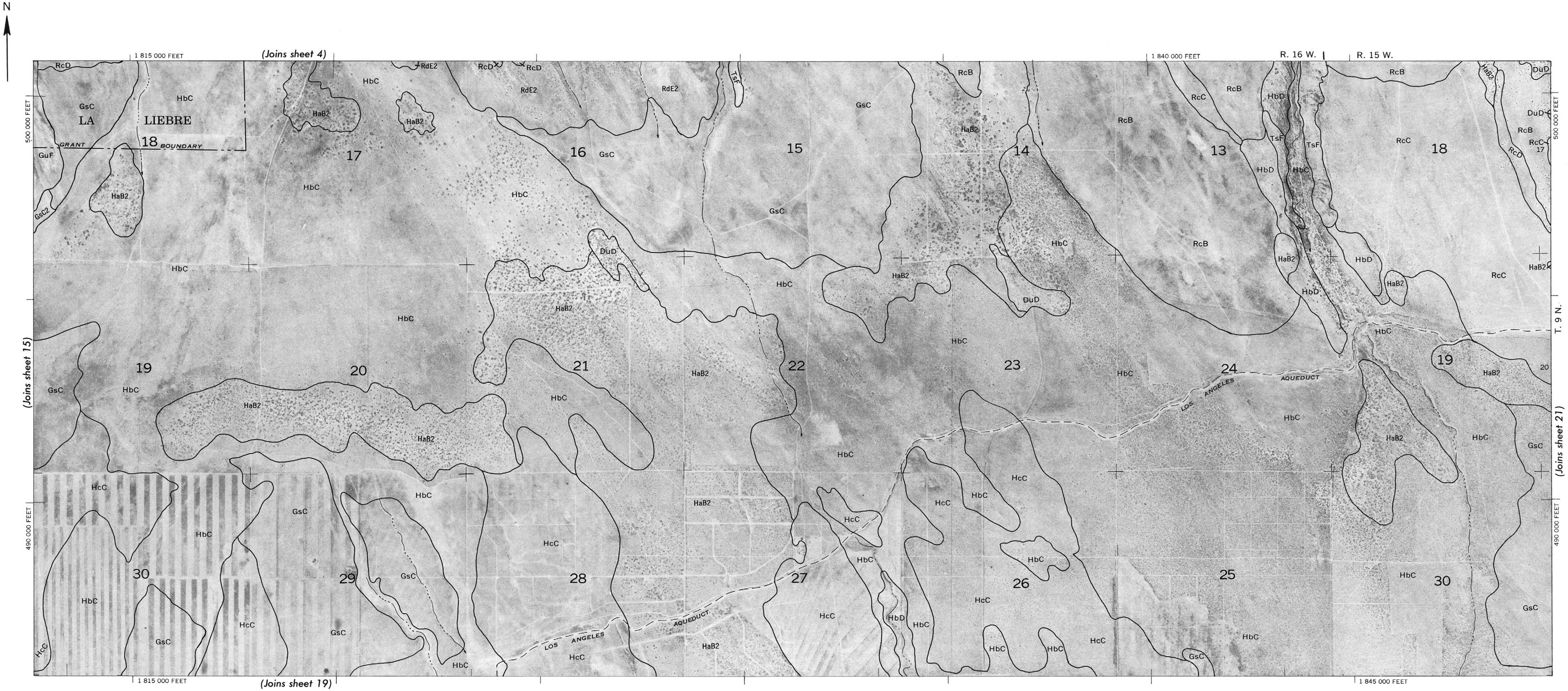
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 17



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 18

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

N

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

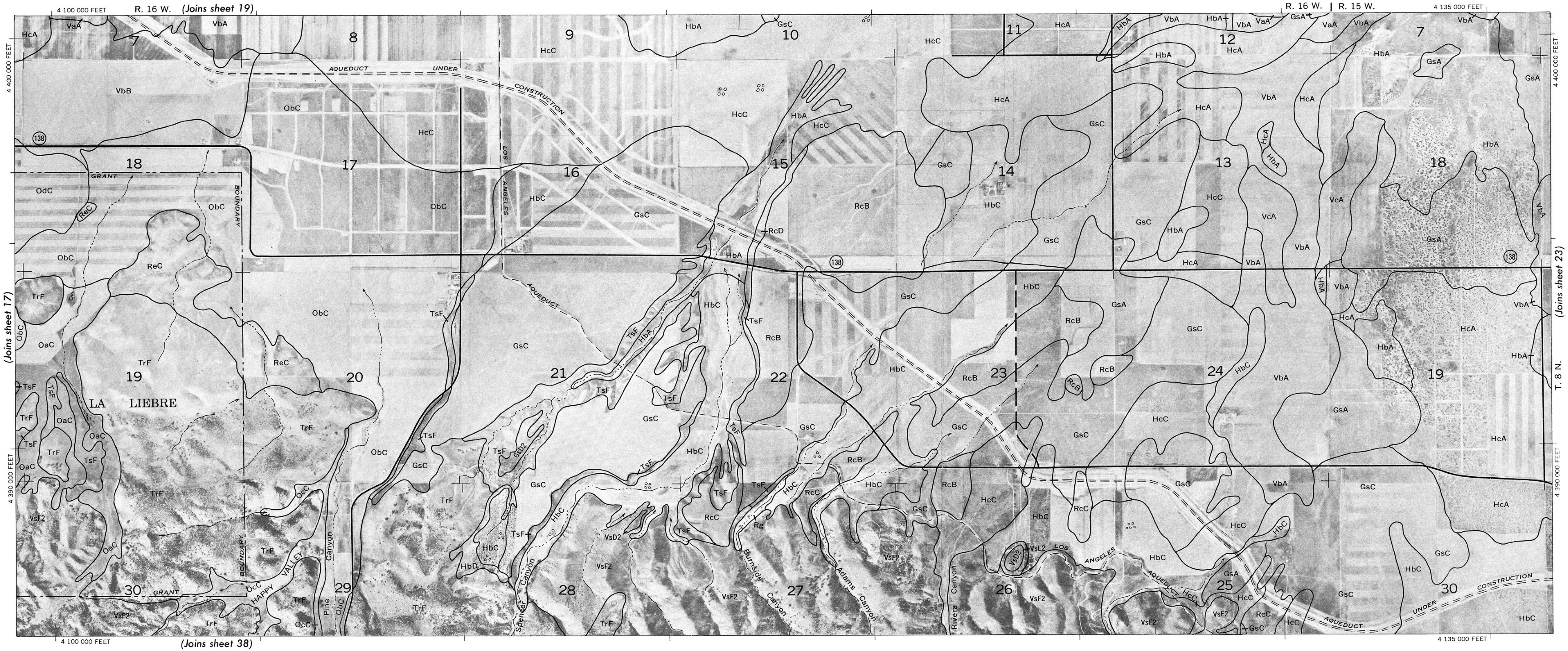
5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 19

N



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 20

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

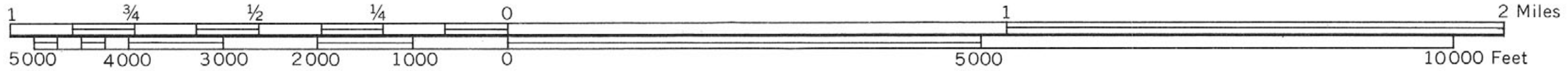
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 21

Scale 1:24 000



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 22

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

N

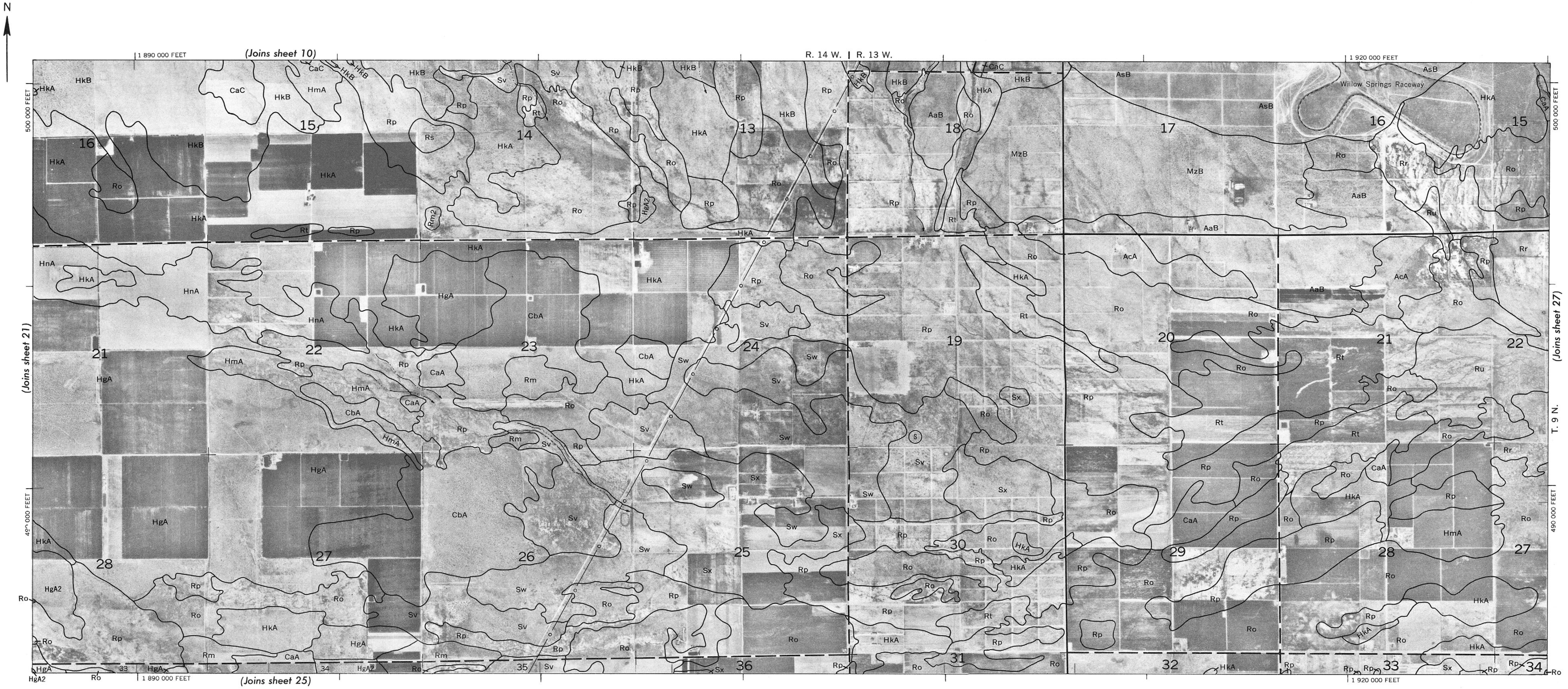
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 24



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 24

Land division corners are approximately positioned on this map.

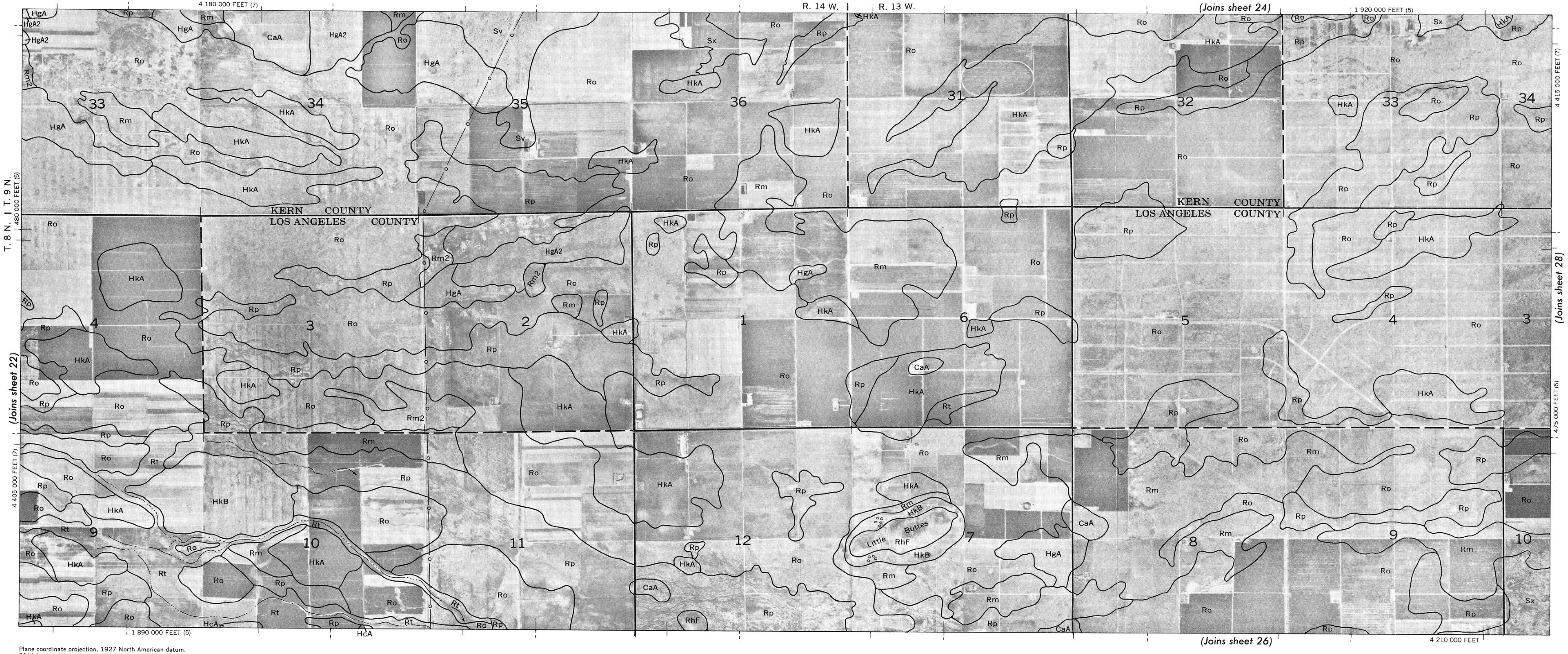
This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 25

N



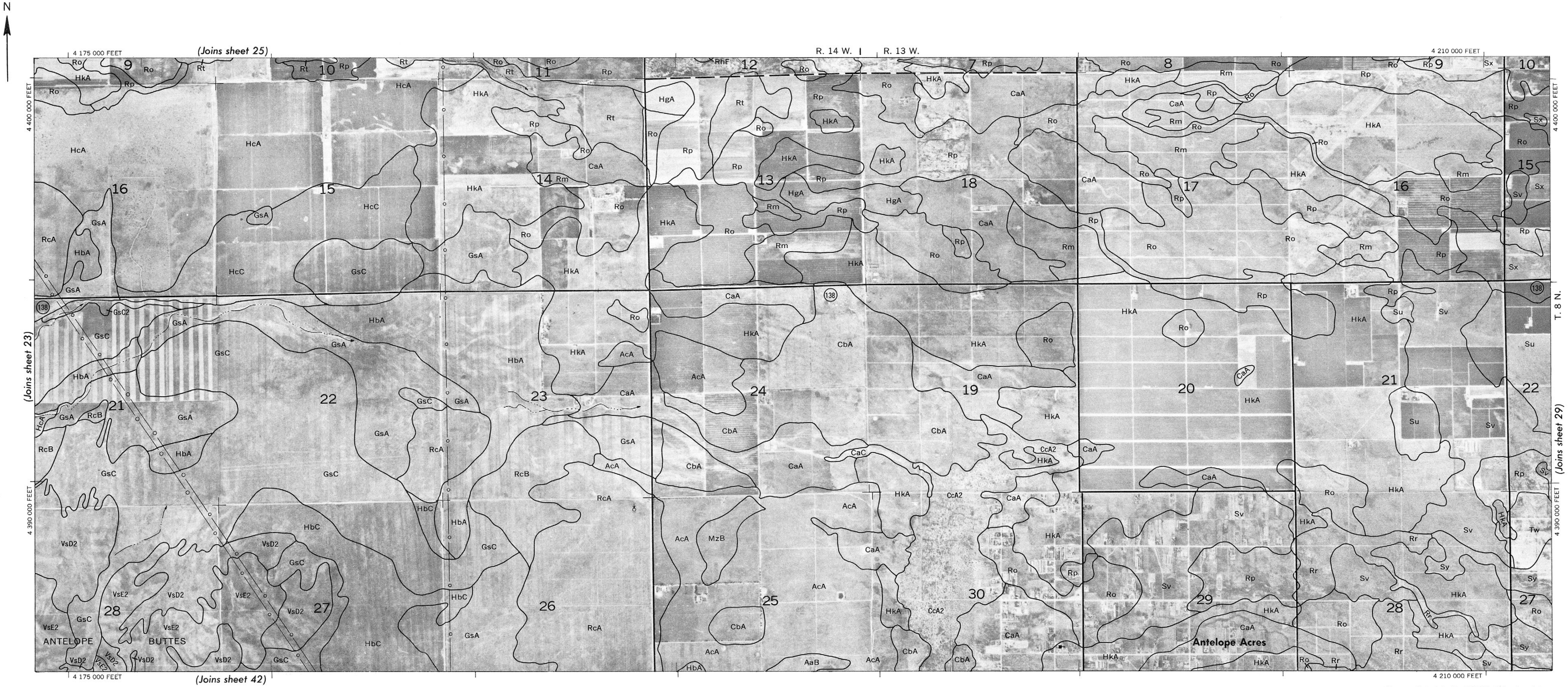
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 26



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

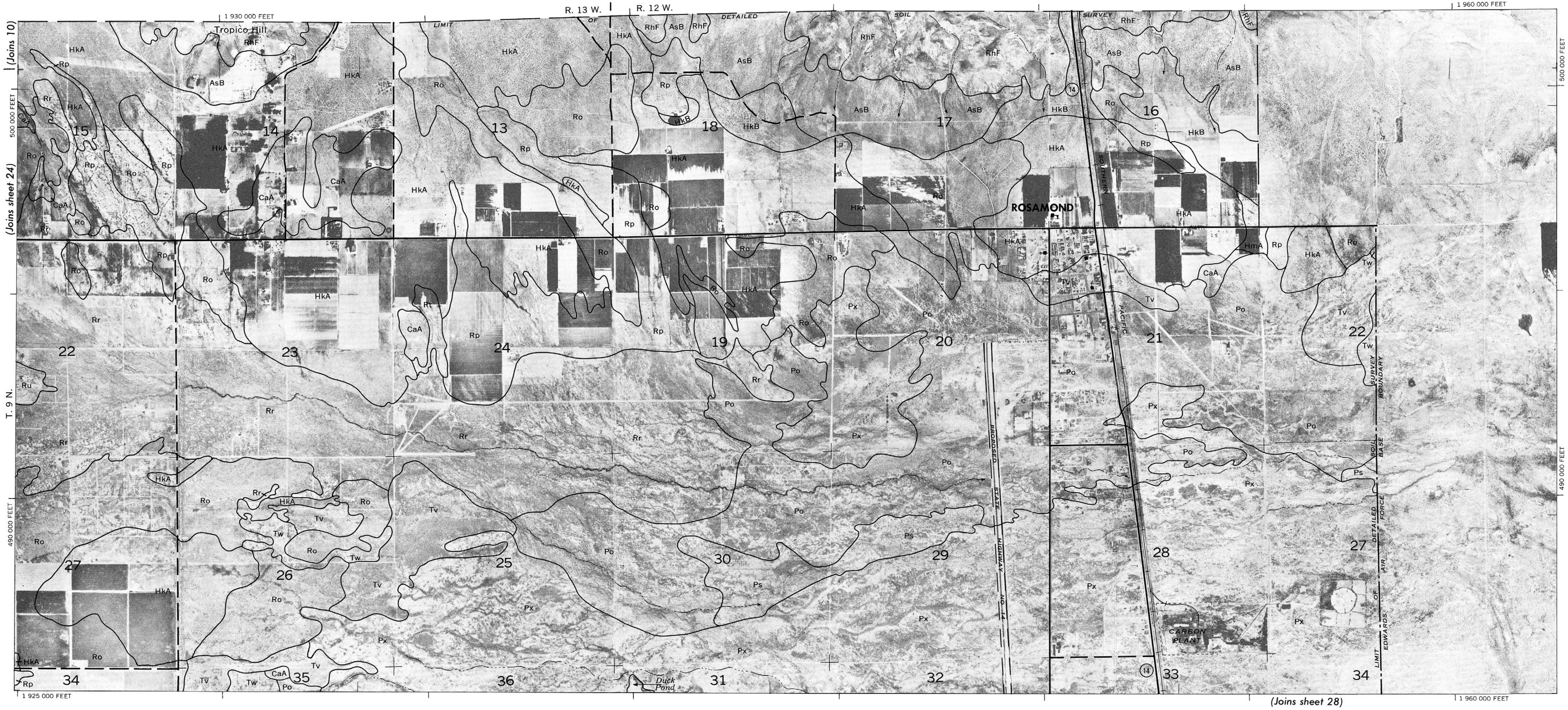
ANTELOPE VALLEY AREA, CALIFORNIA NO. 26

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 27

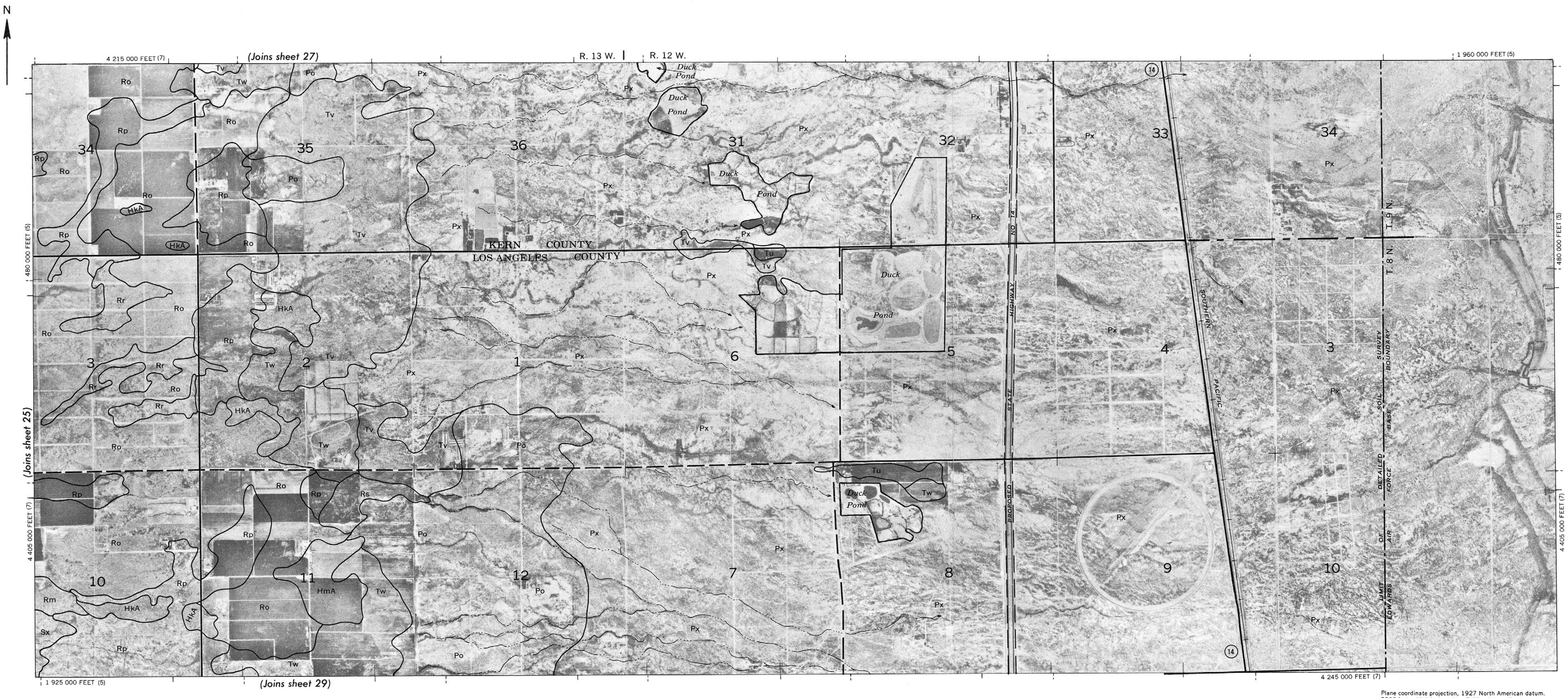


Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

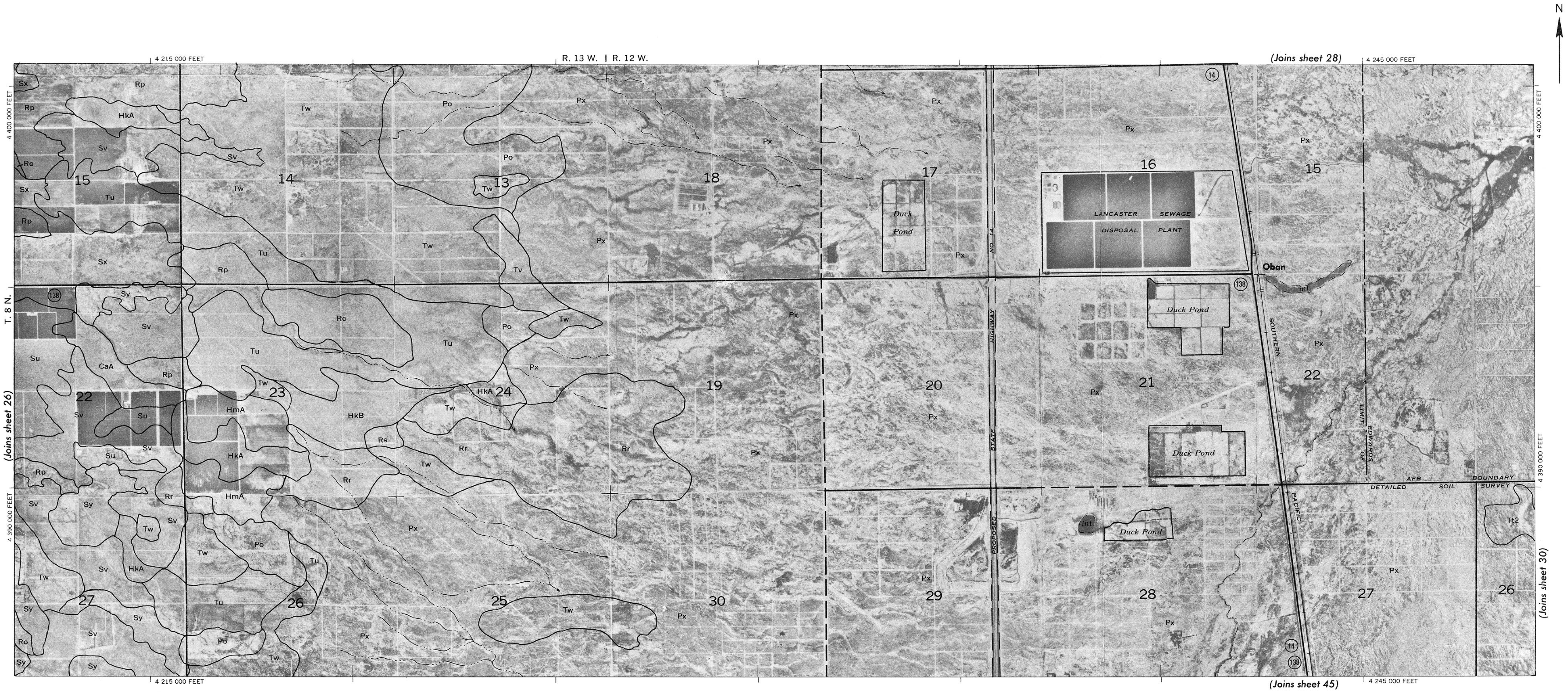
5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 28

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
ANTELOPE VALLEY AREA, CALIFORNIA NO. 29



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

N

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 30

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

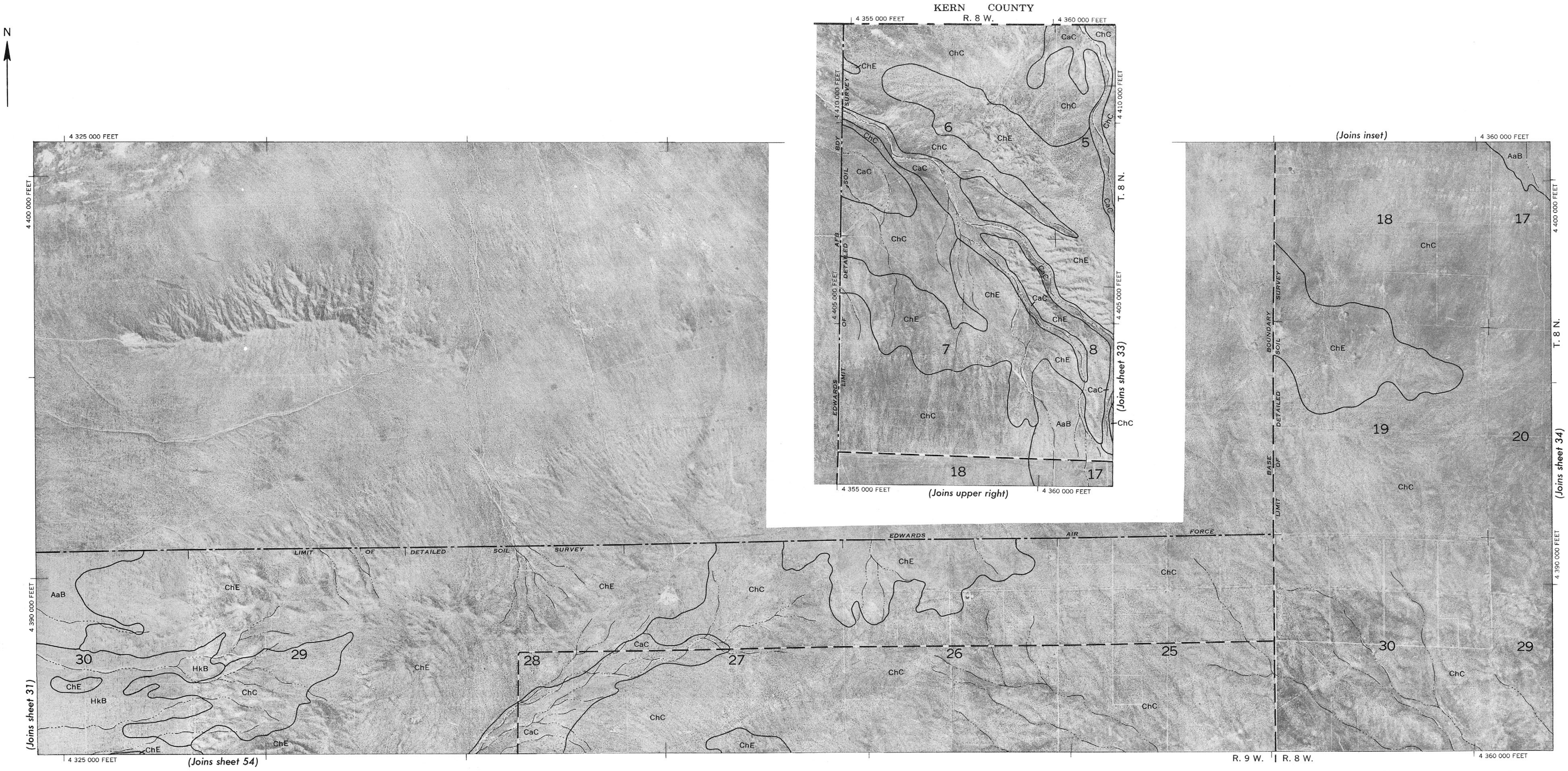
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 31



Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 32

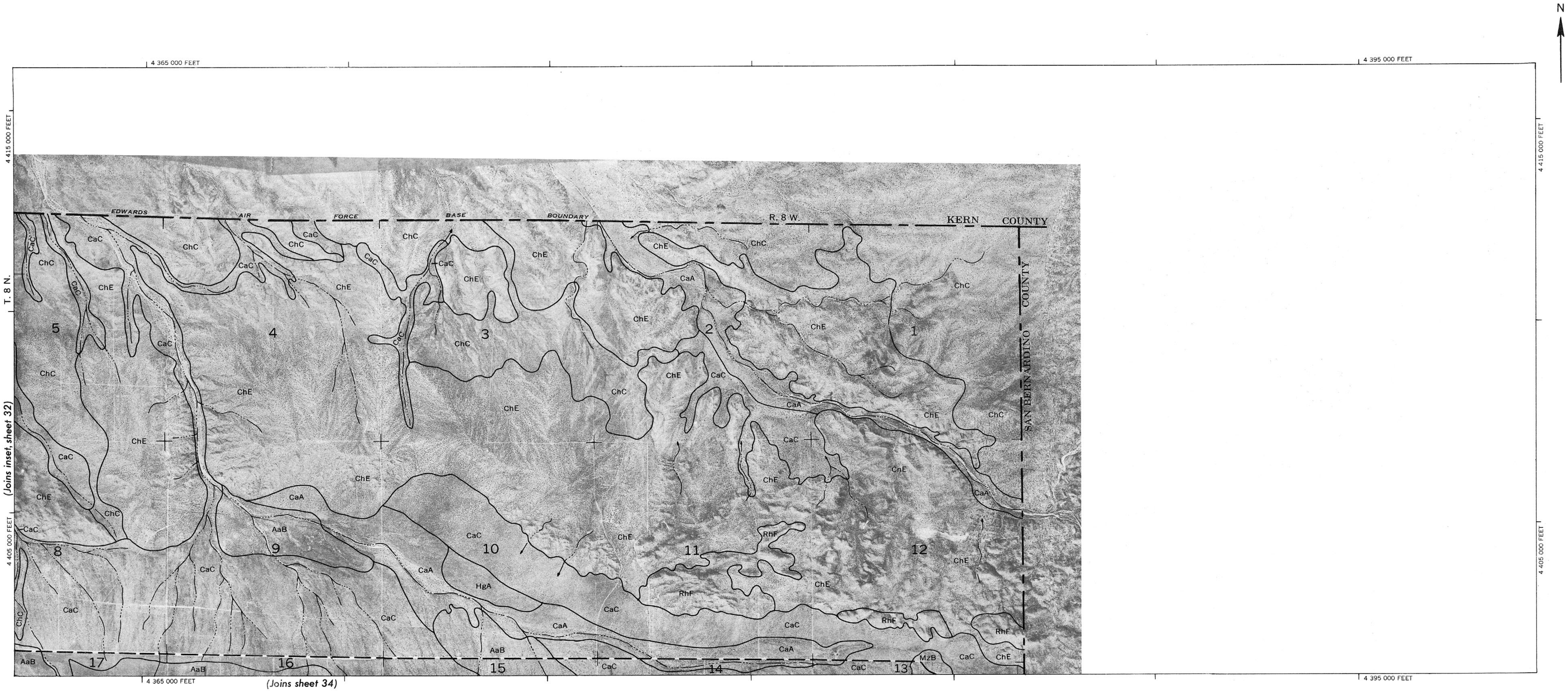
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 33



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 34

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

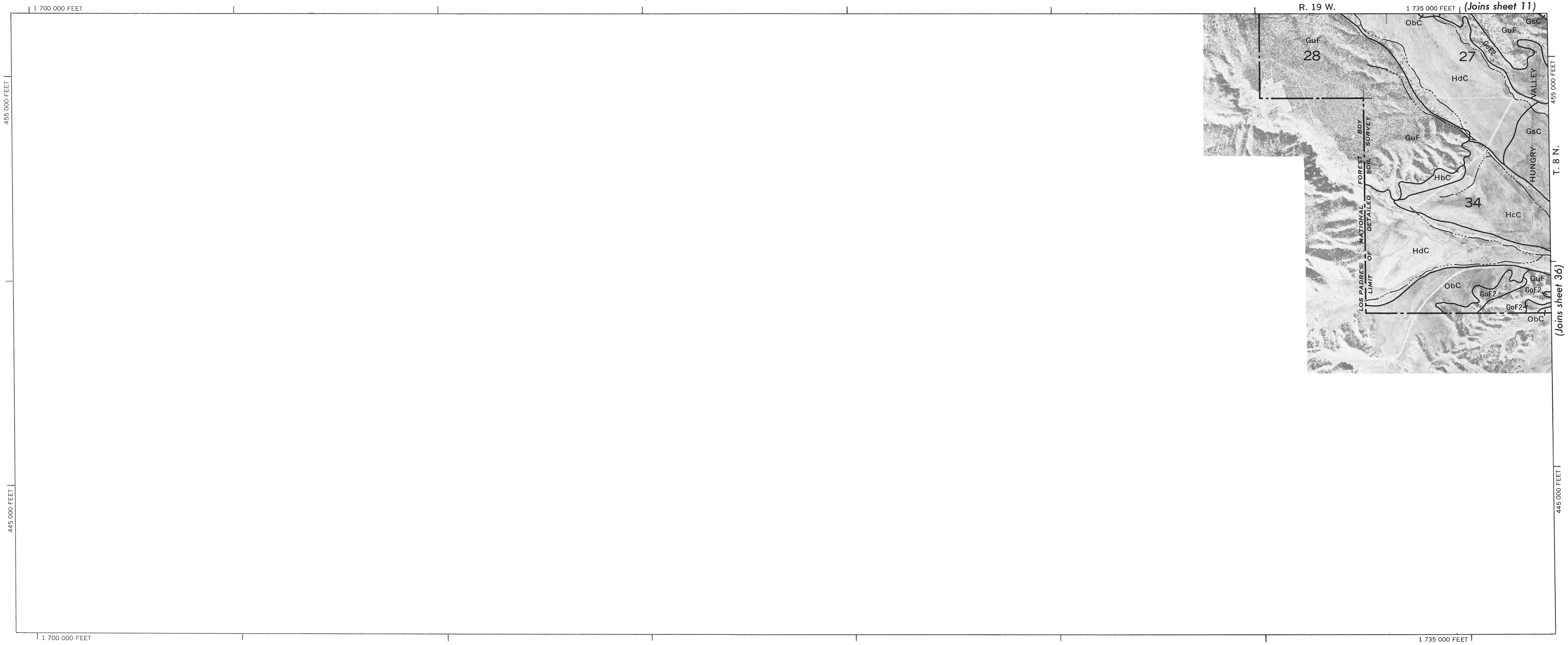
5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALFIRONIA NO. 34

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N



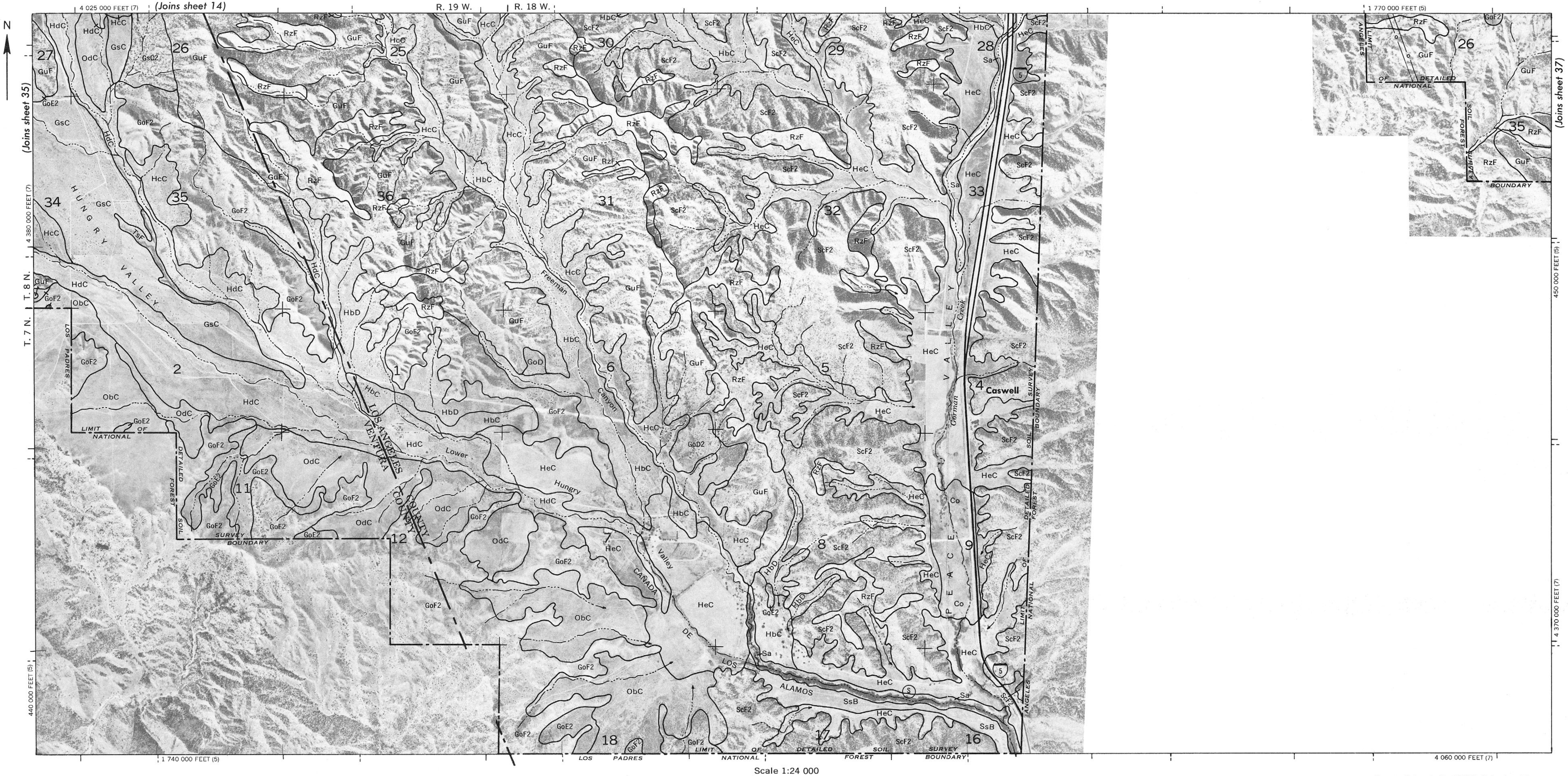
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 5. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.



Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

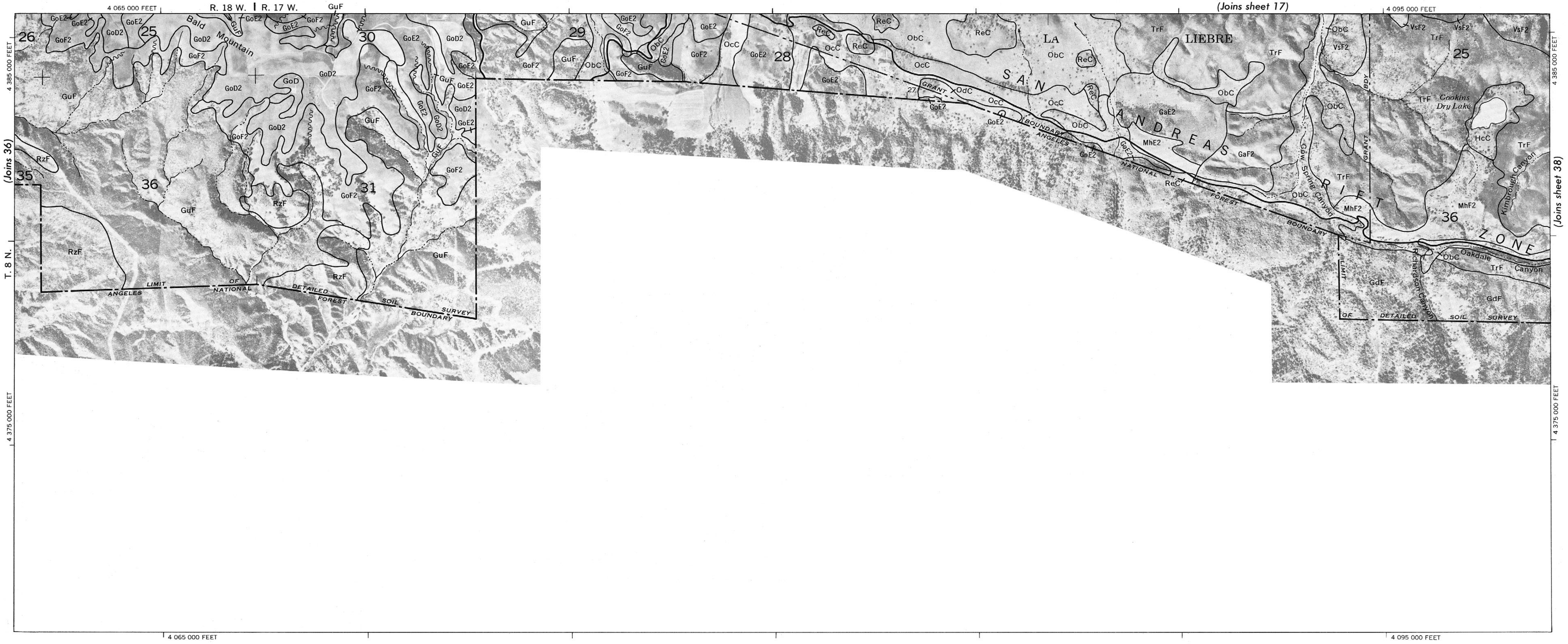
5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zones 5 and 7. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 36

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.



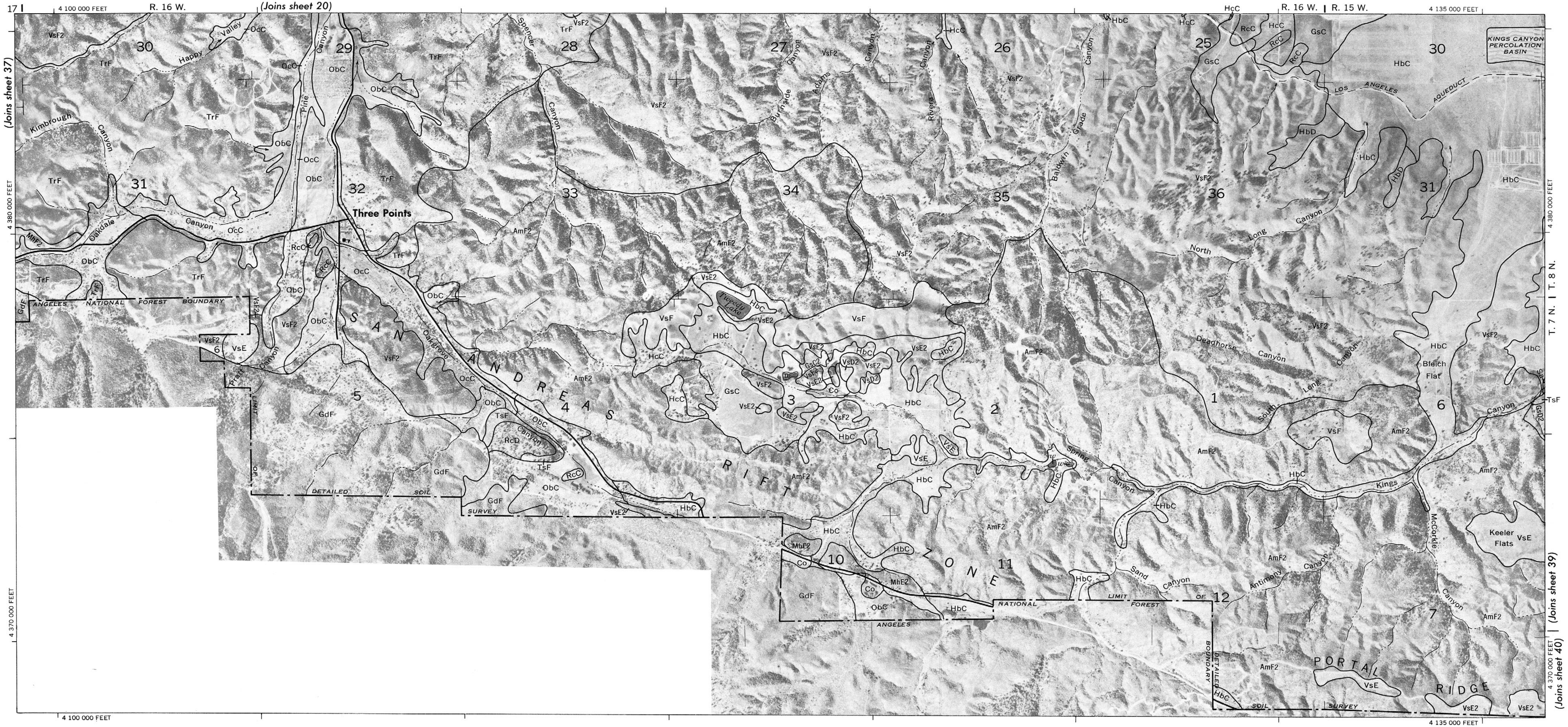
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.



4 100 000 FEET — 4 135 000 FEET

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 38

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 39

N

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 40

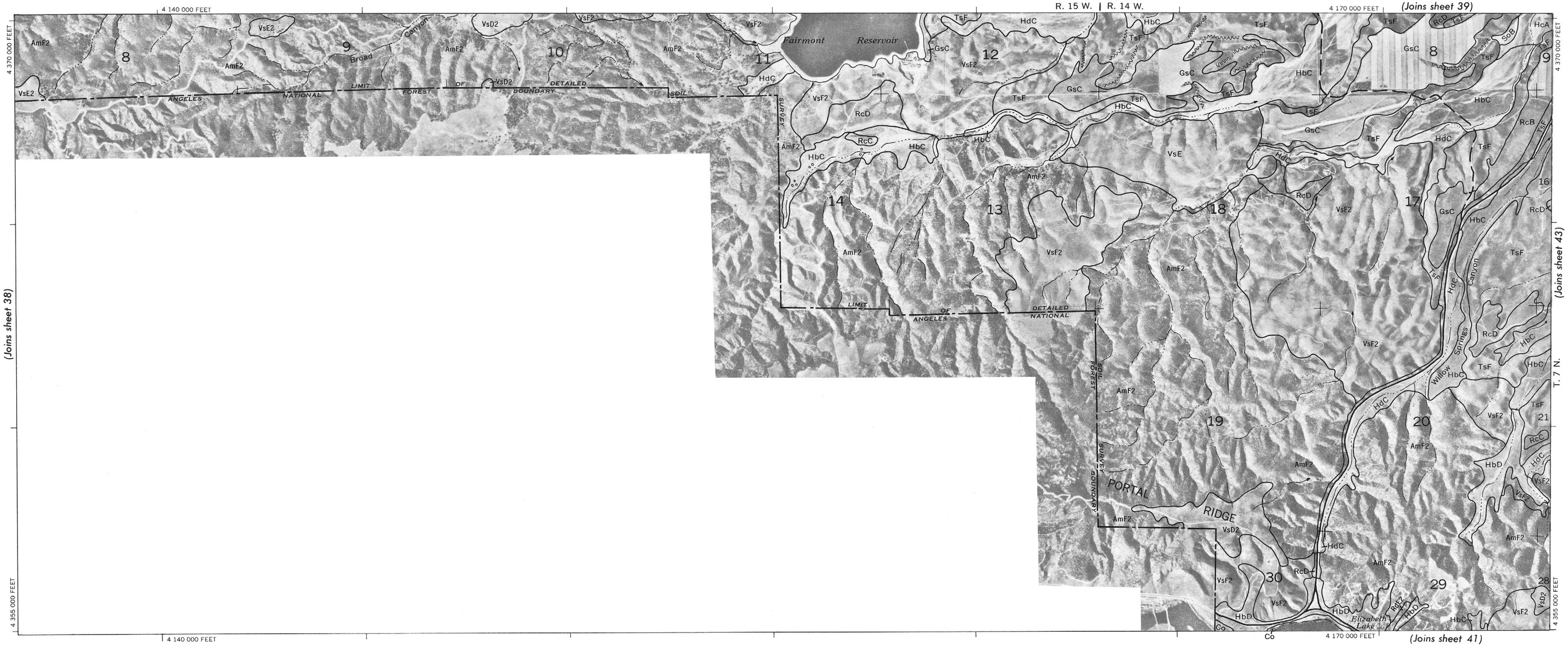
N

(Joins sheet 39)

(Joins sheet 38)

(Joins sheet 43)

(Joins sheet 41)



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

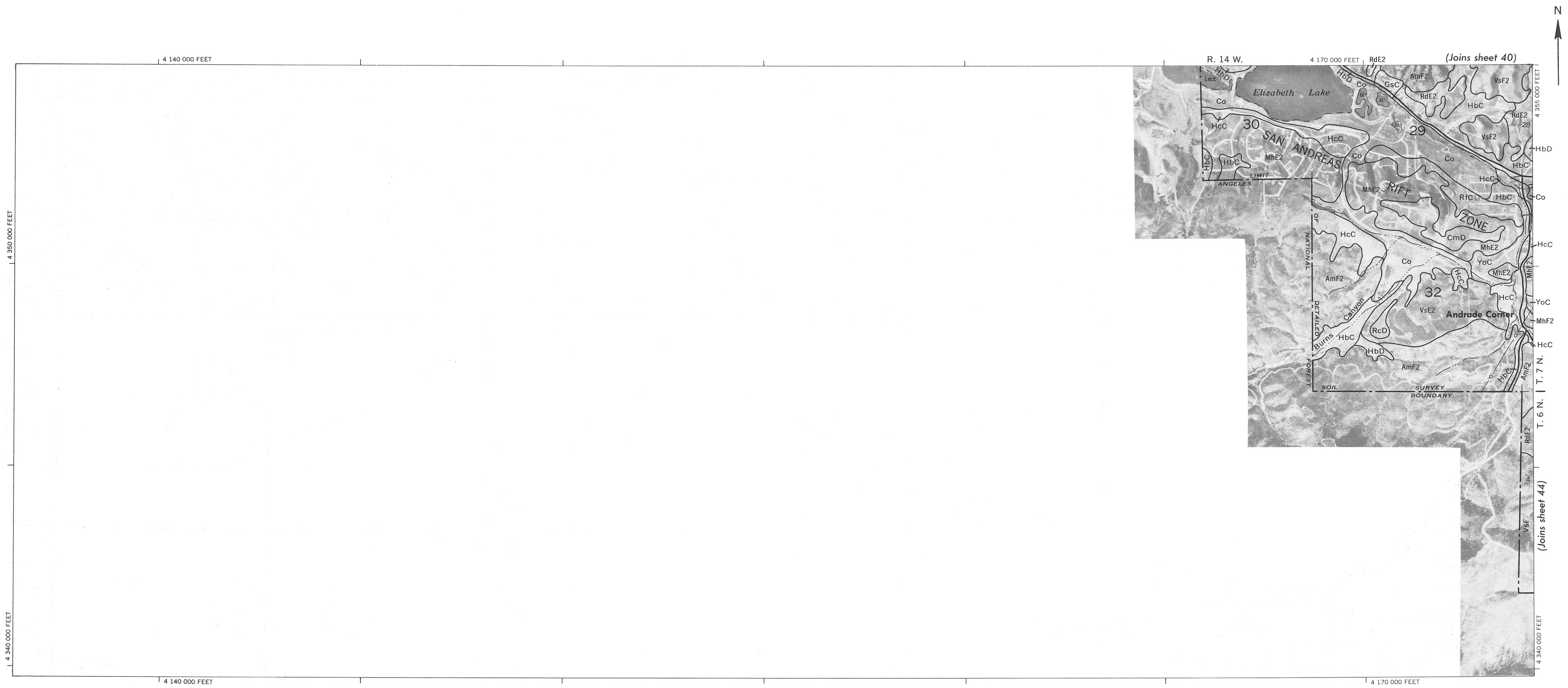
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 40

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.



This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 41

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

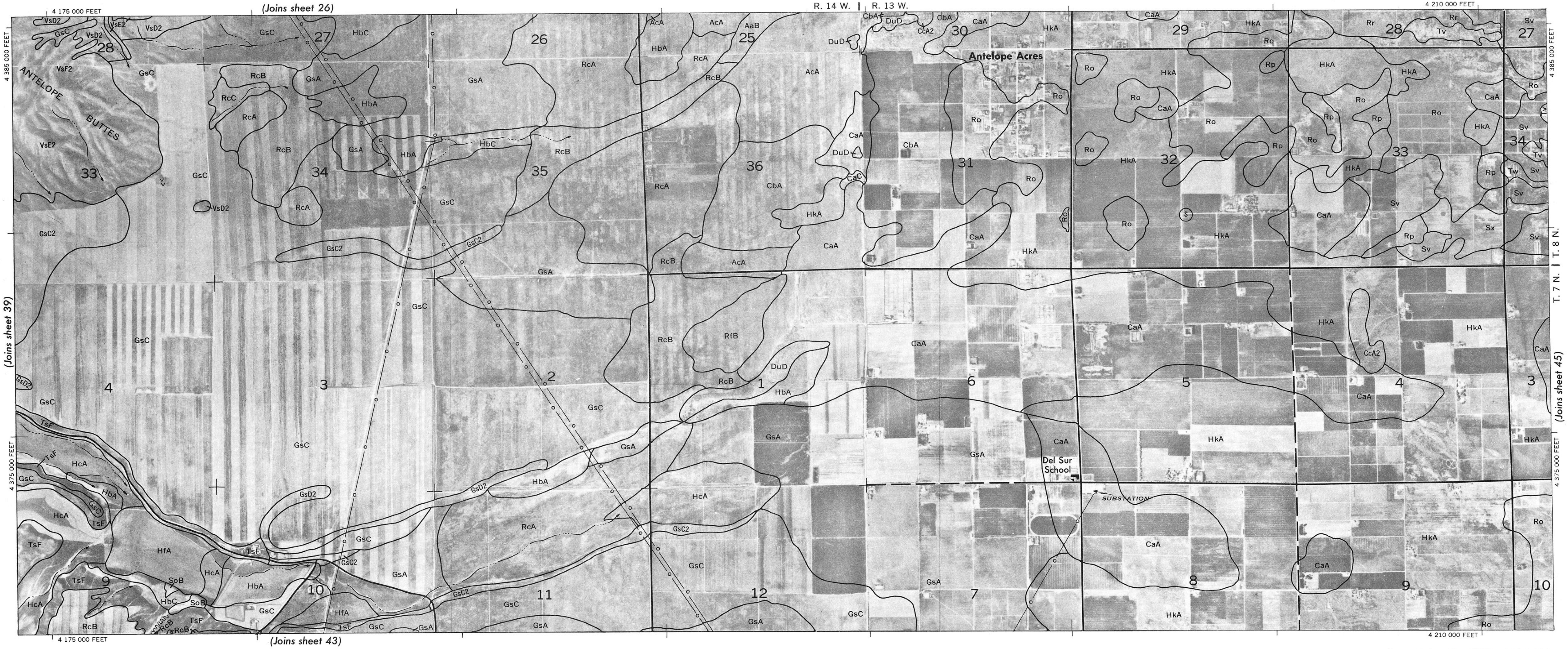
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 42

N



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 42

Land division corners are approximately positioned on this map.

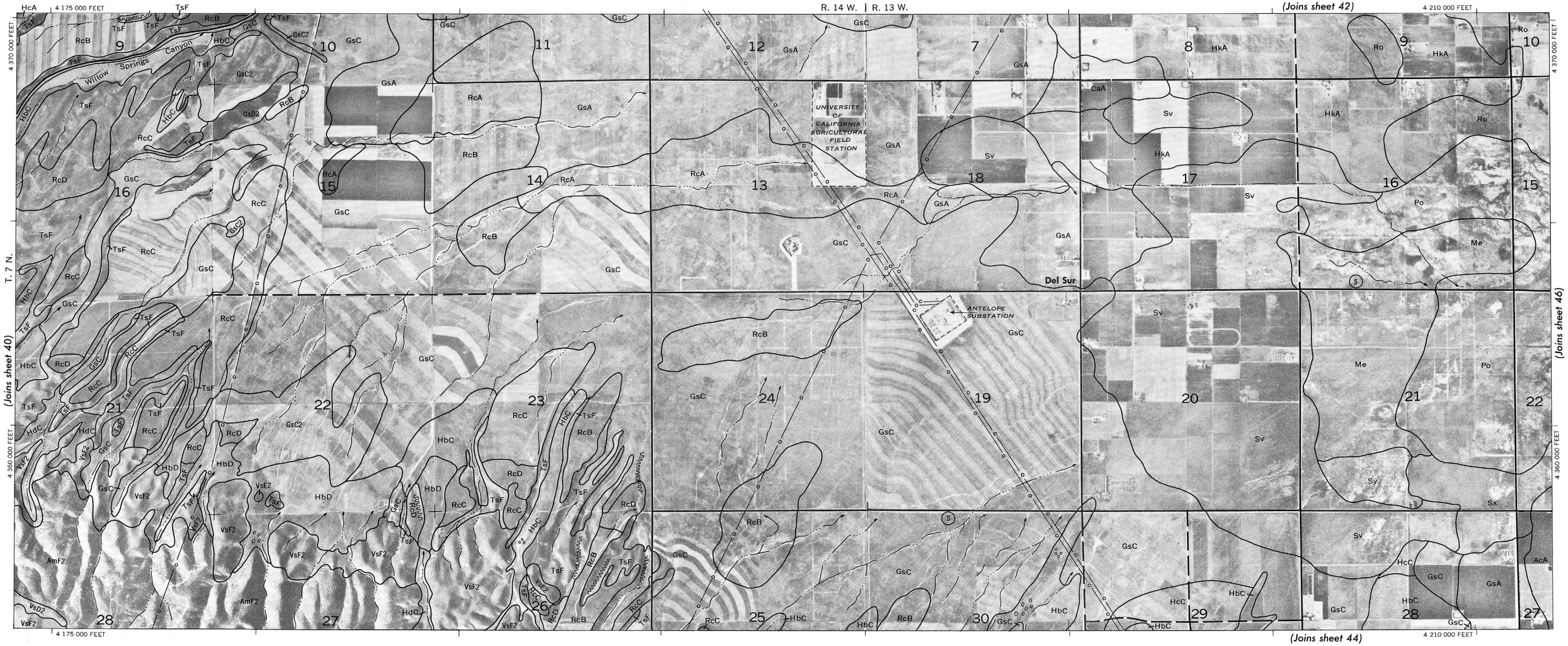
This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 43



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

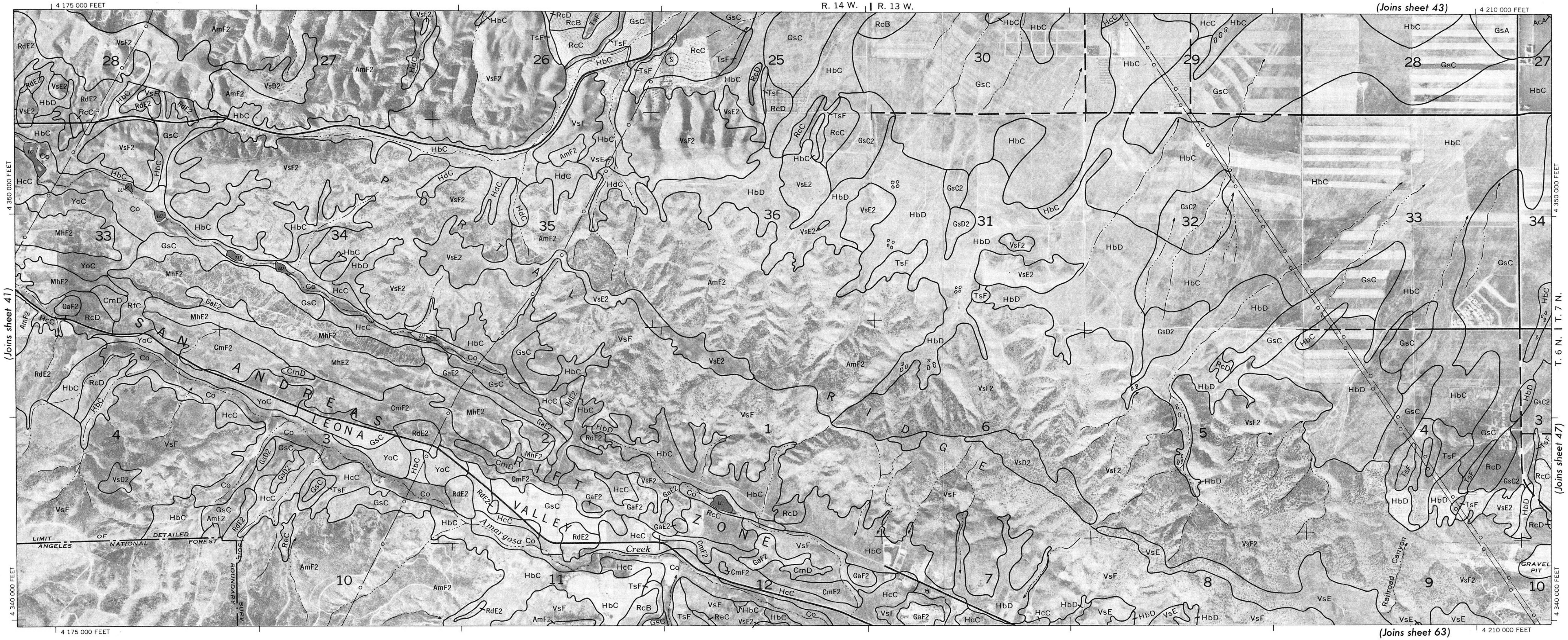
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 44

N



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

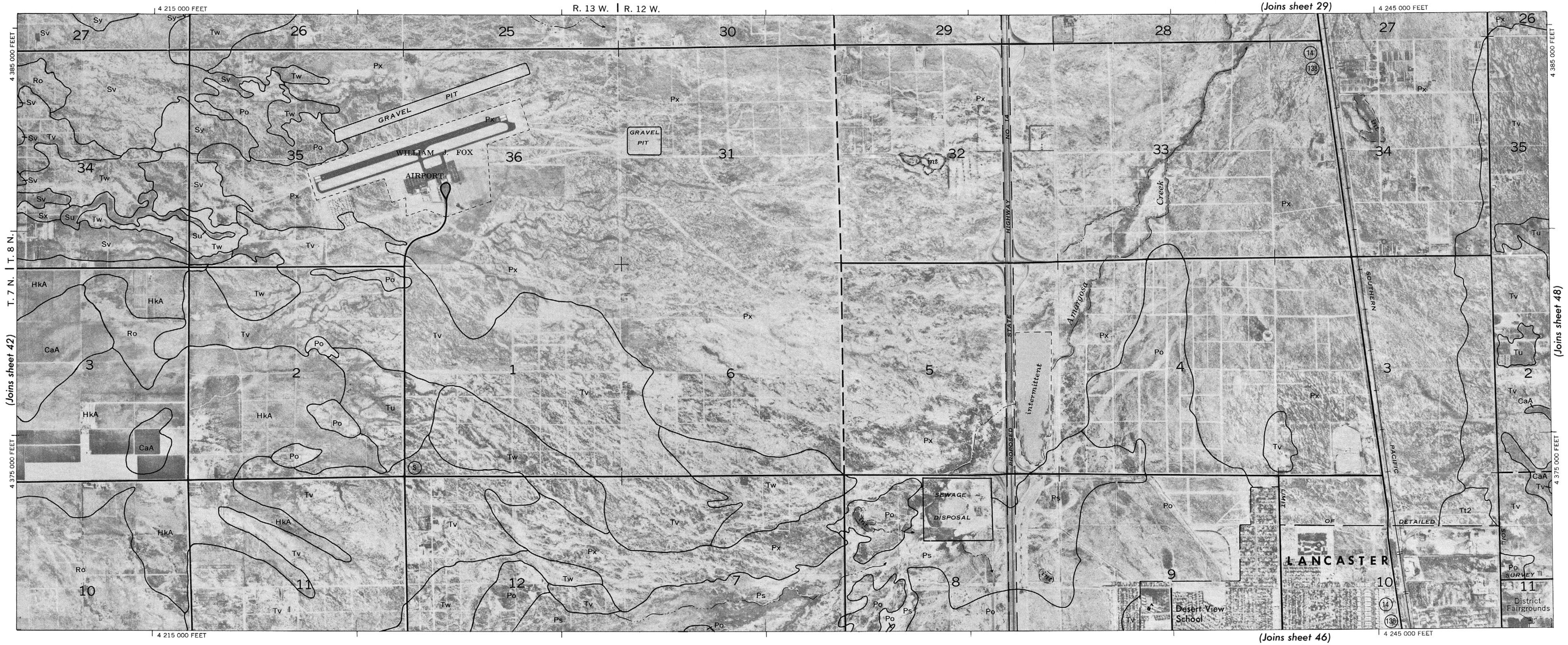
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 44

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

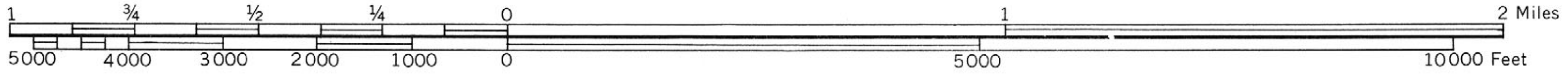


Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

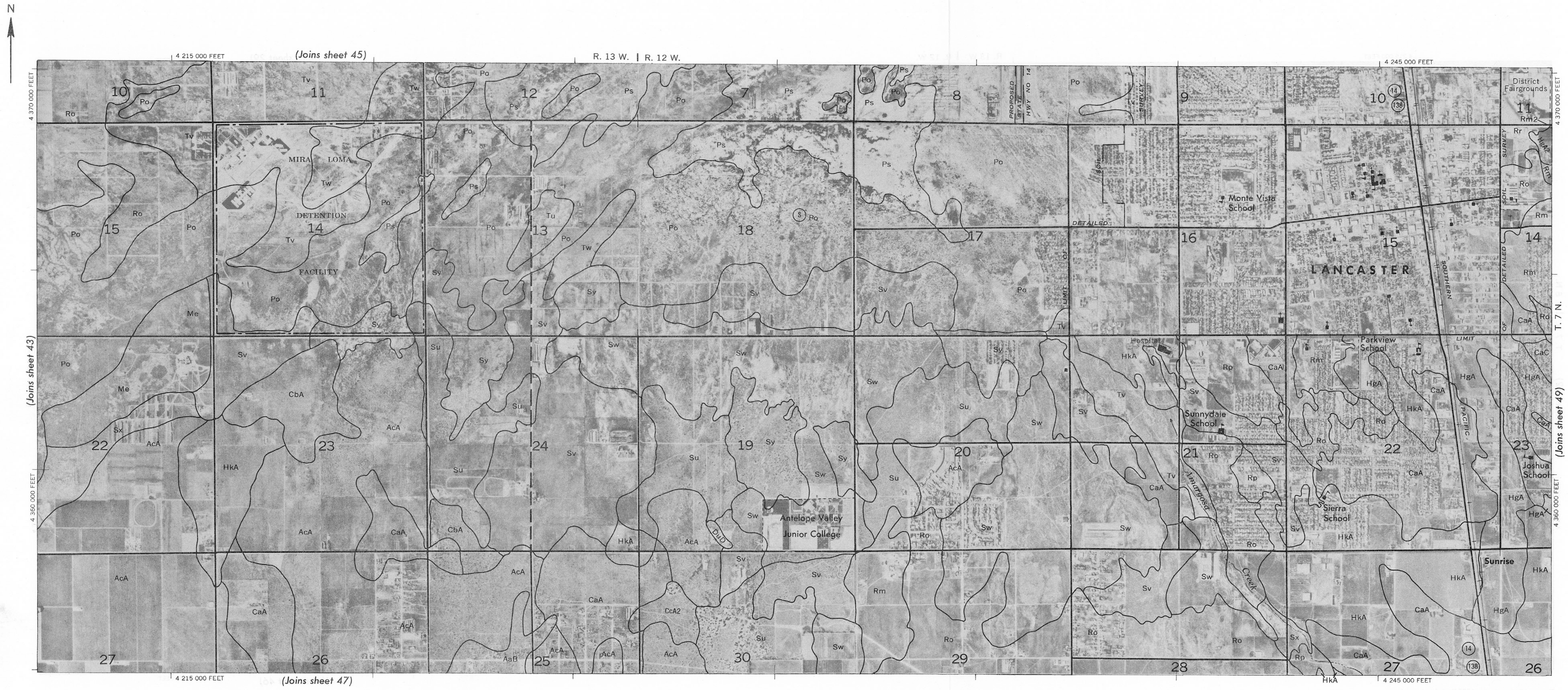
This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 45

Scale 1:24 000



46



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

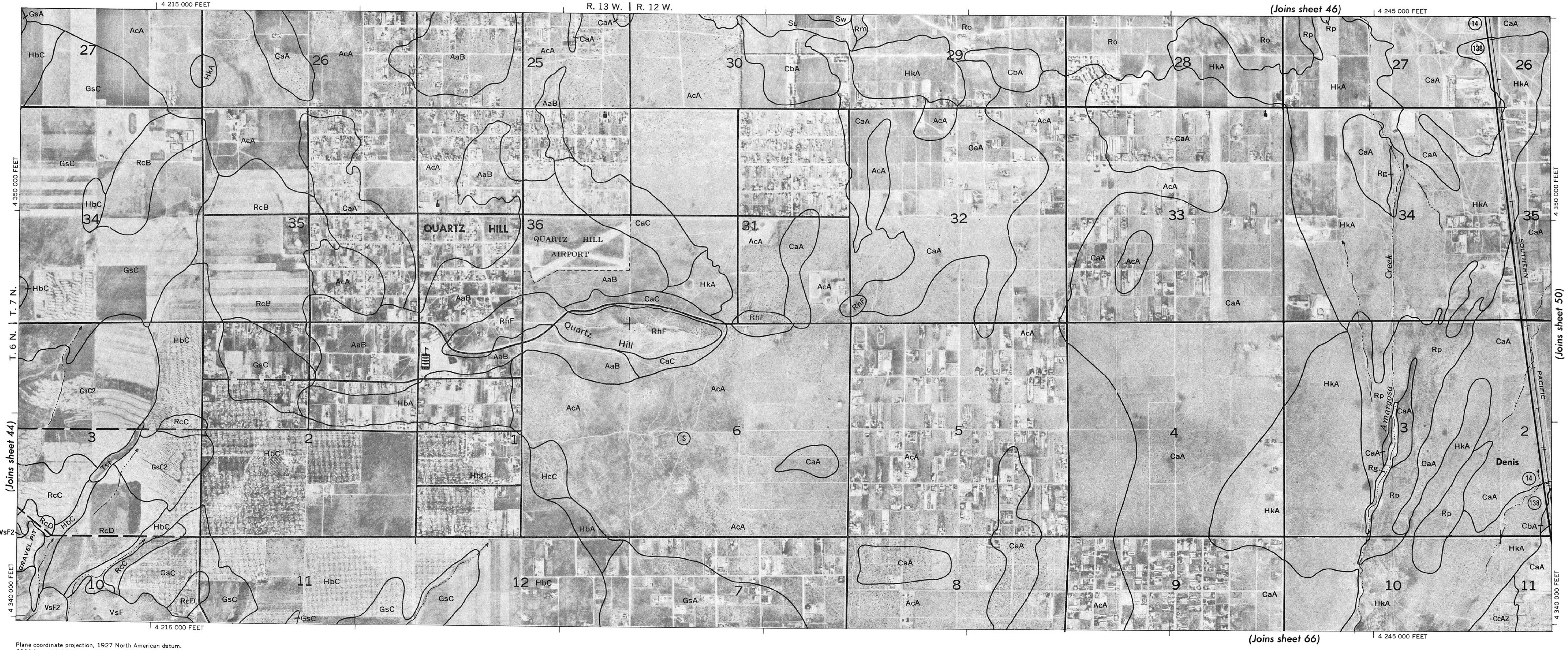
ANTELOPE VALLEY AREA, CALIFORNIA NO. 46

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 47



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 48

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 49

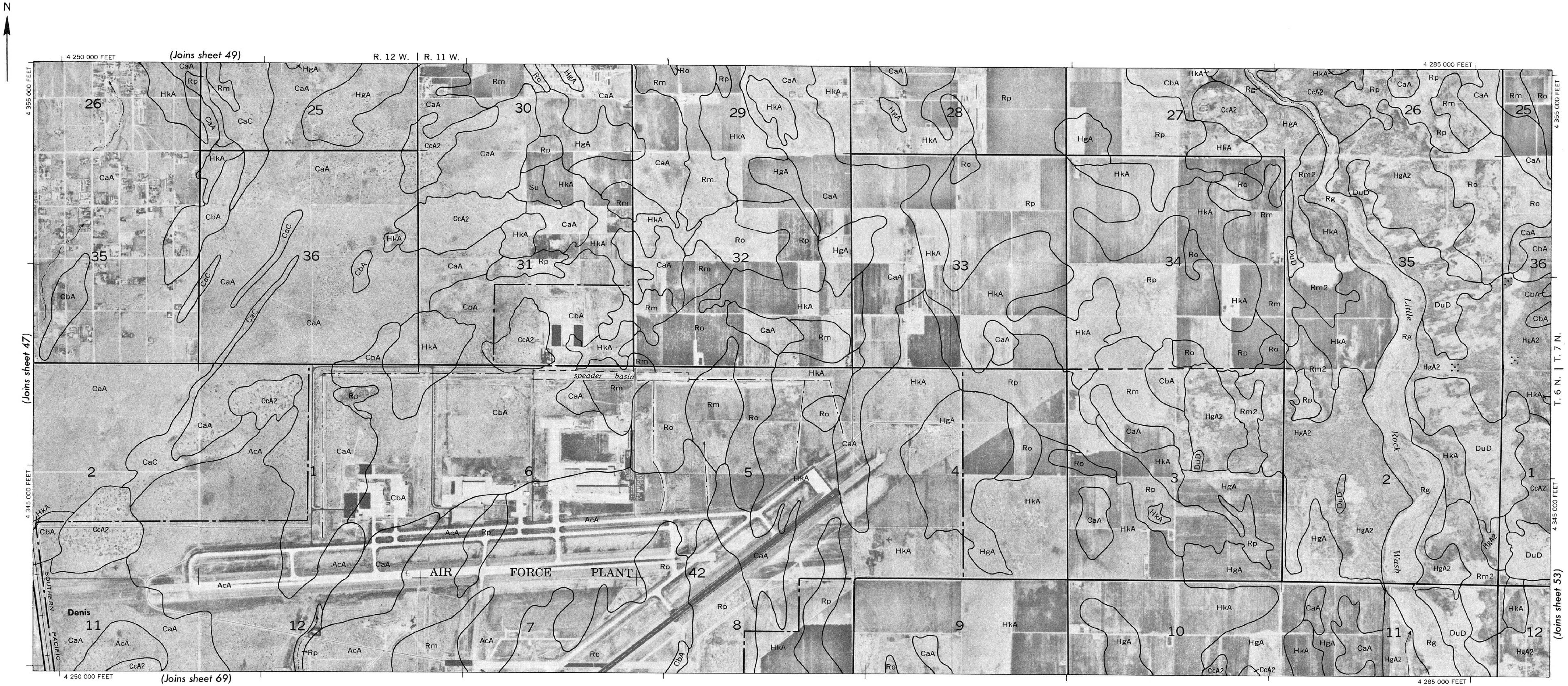
N

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

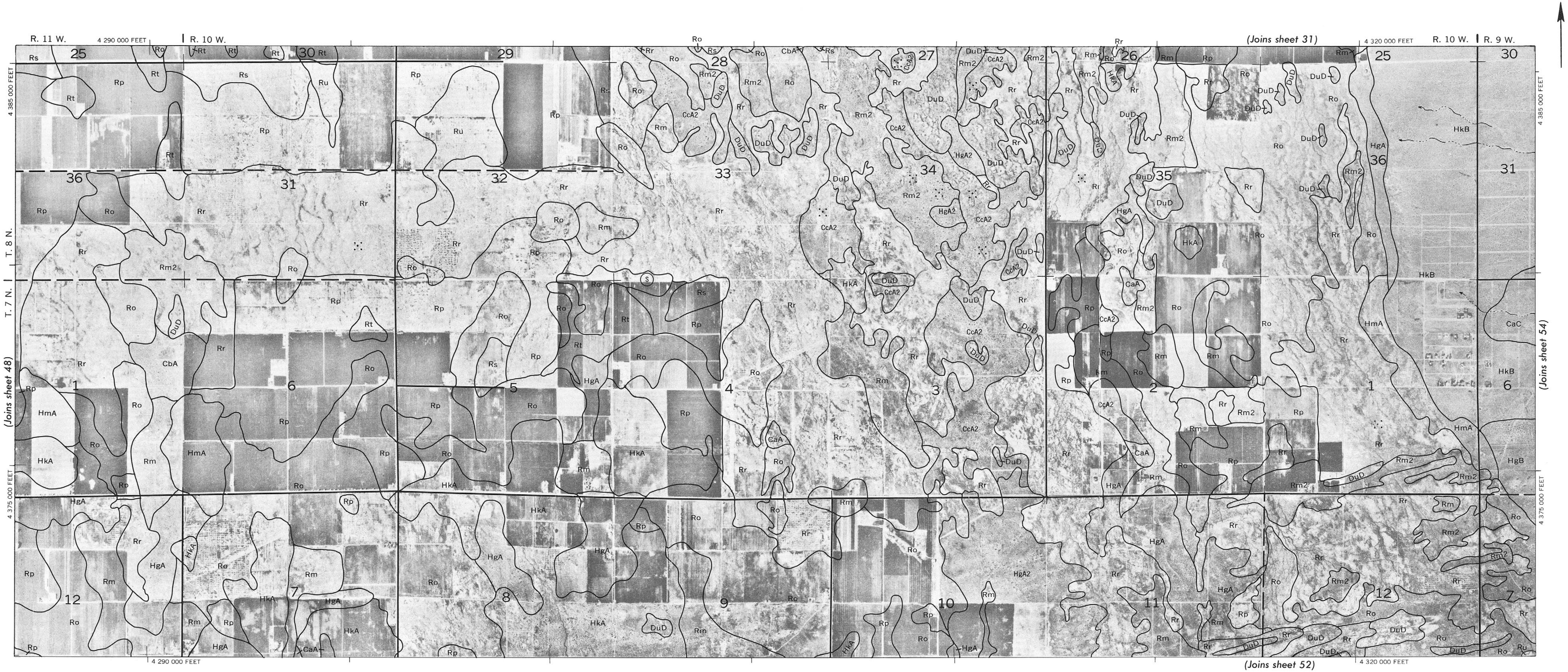
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 50

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.



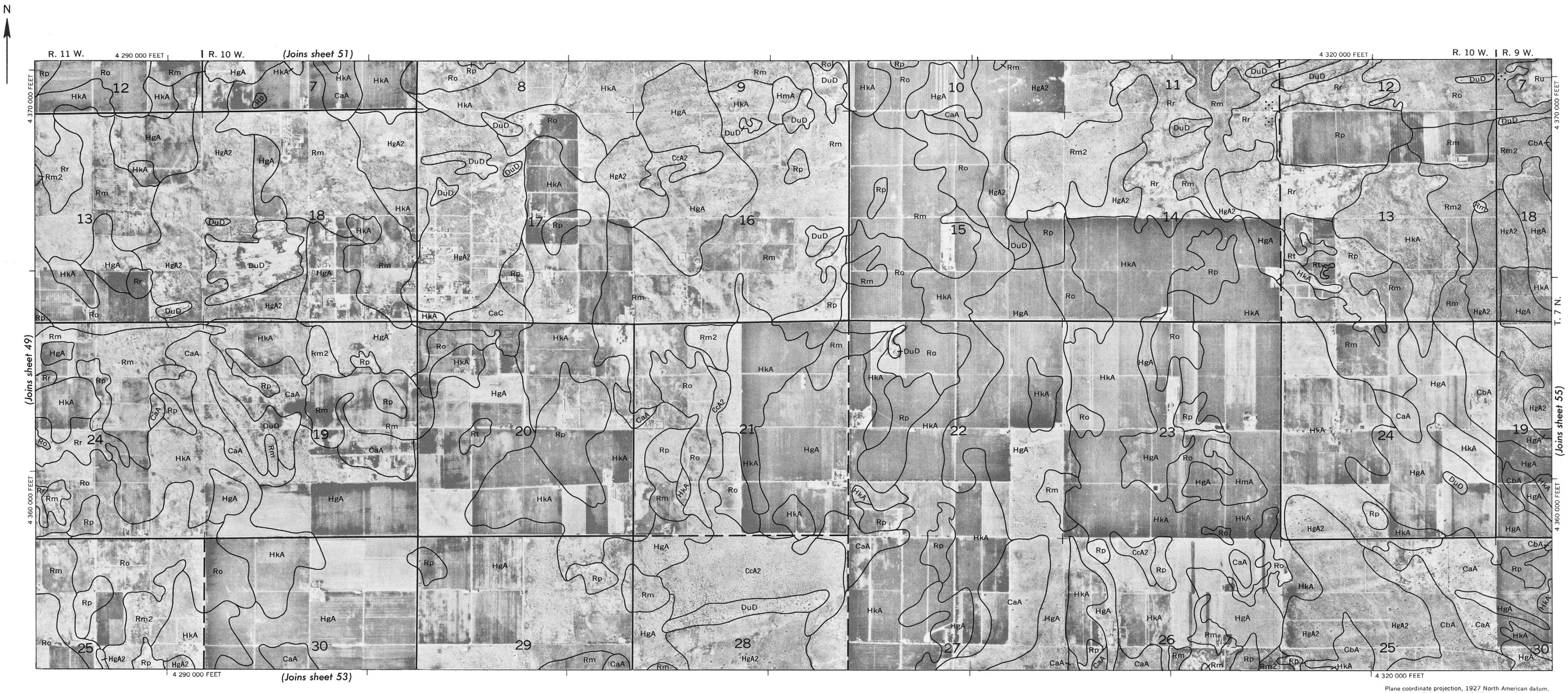
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 52



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

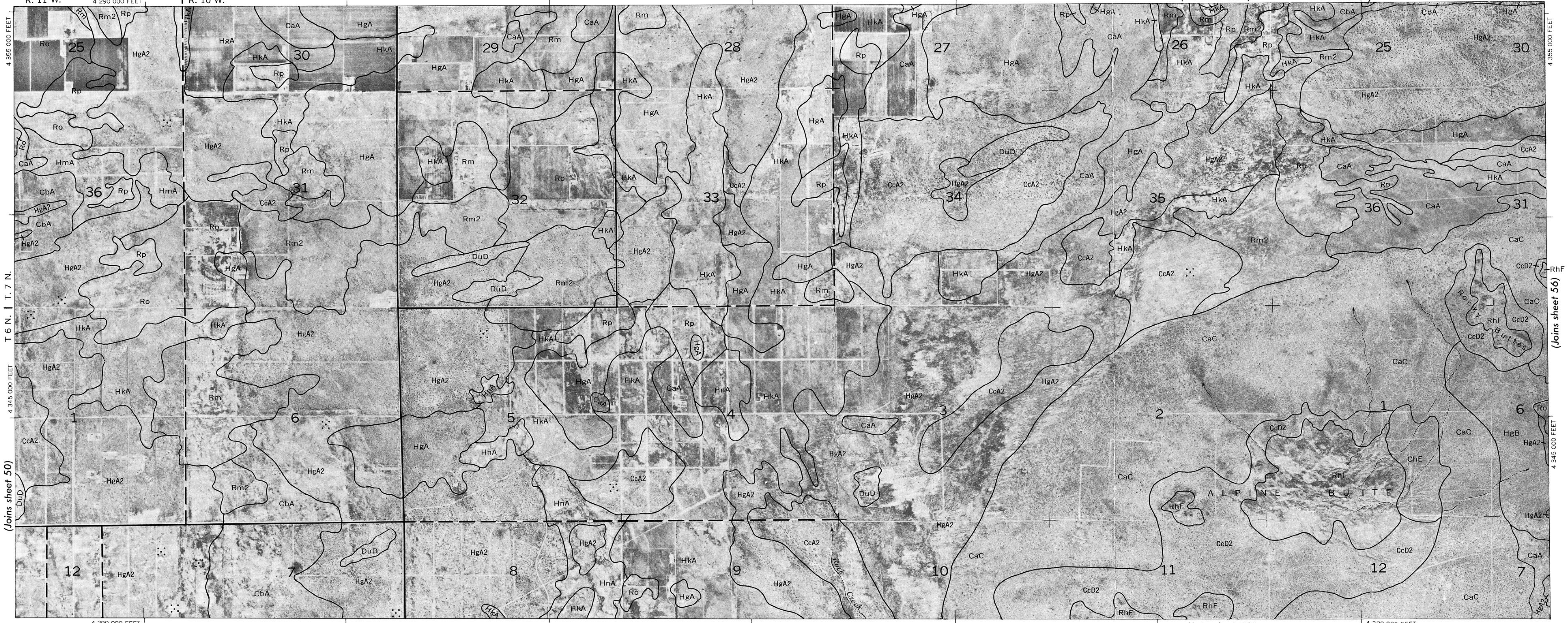
5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 52

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N



This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 53

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 54

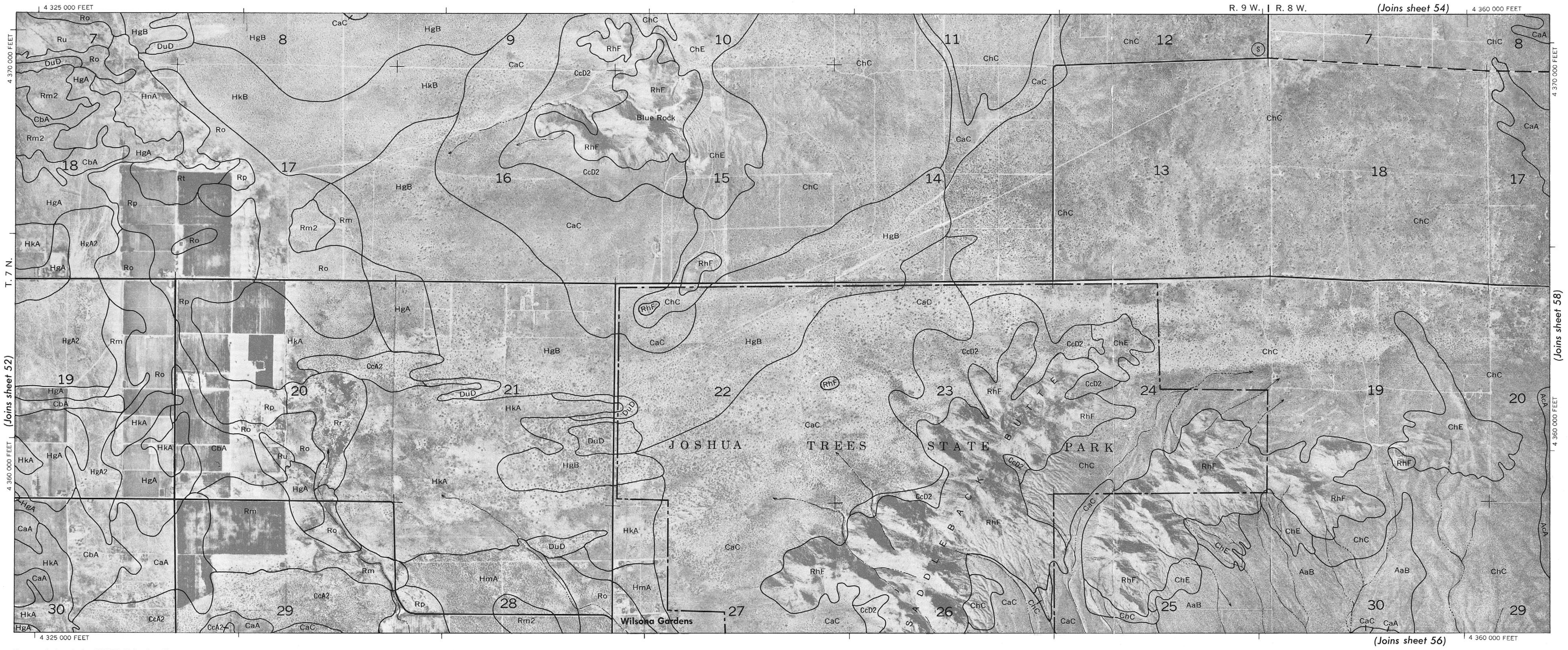
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 55



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

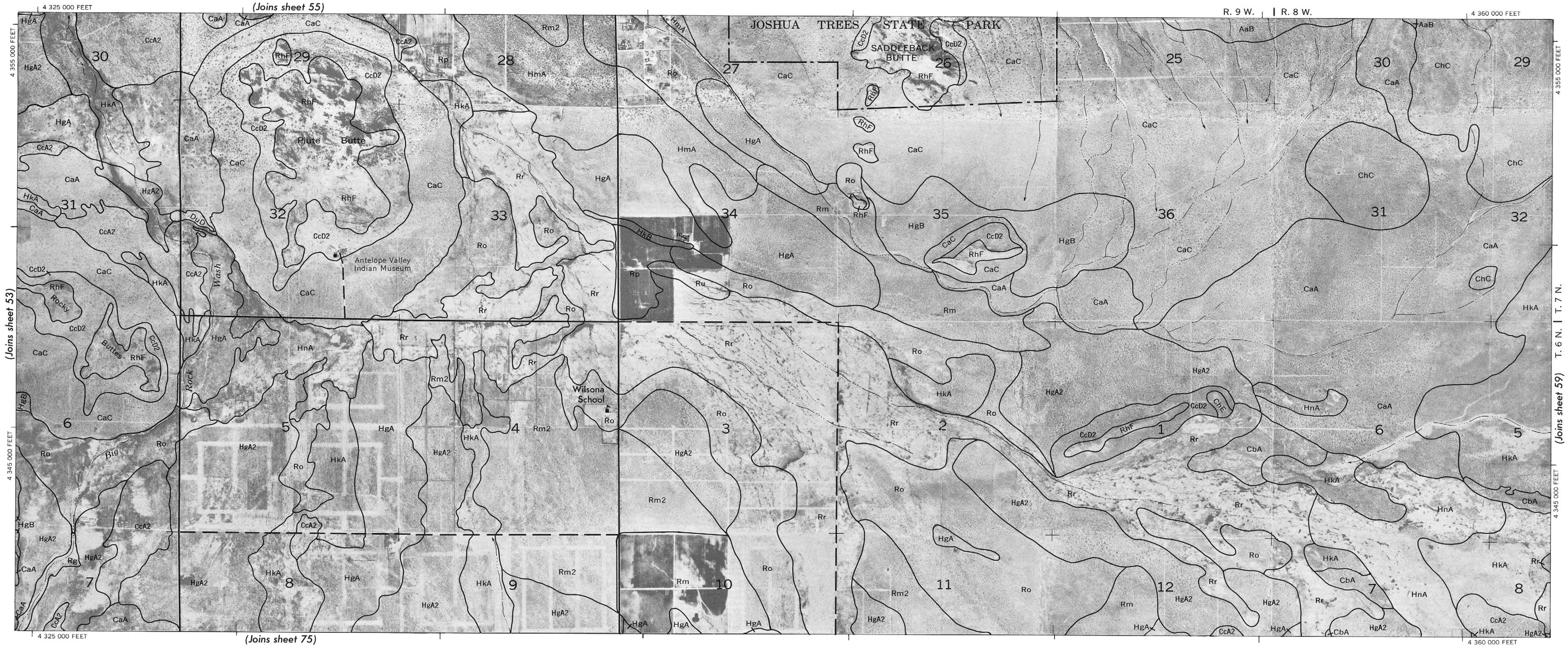
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 56

N



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 56

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

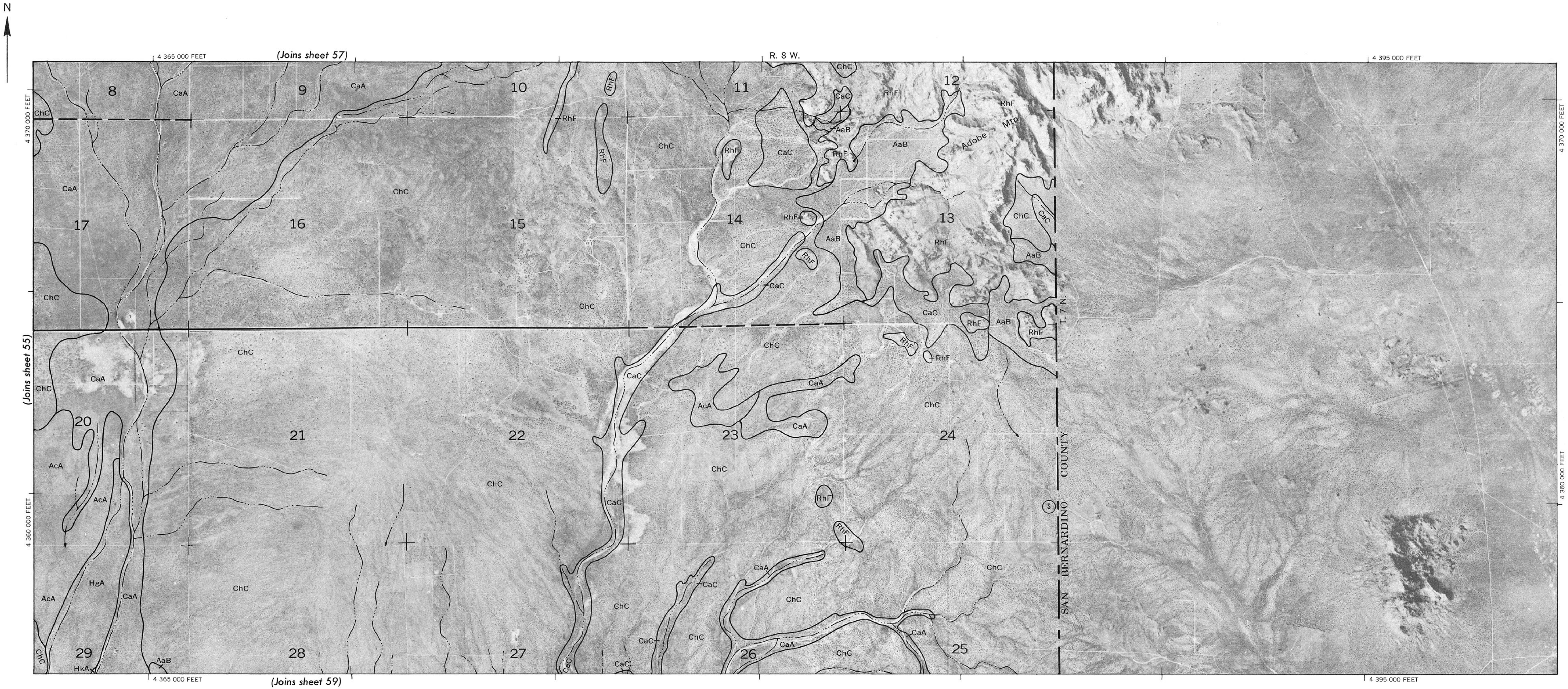
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 57



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 58

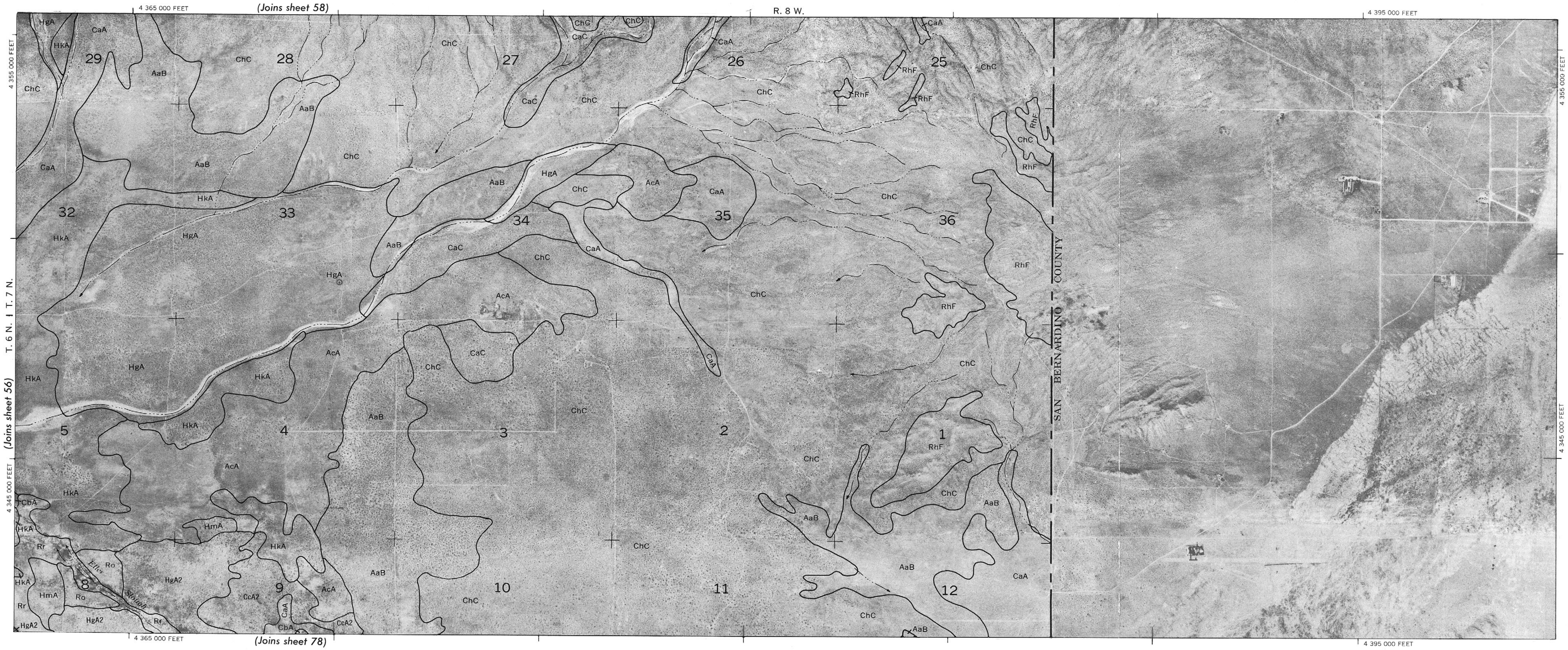
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 59

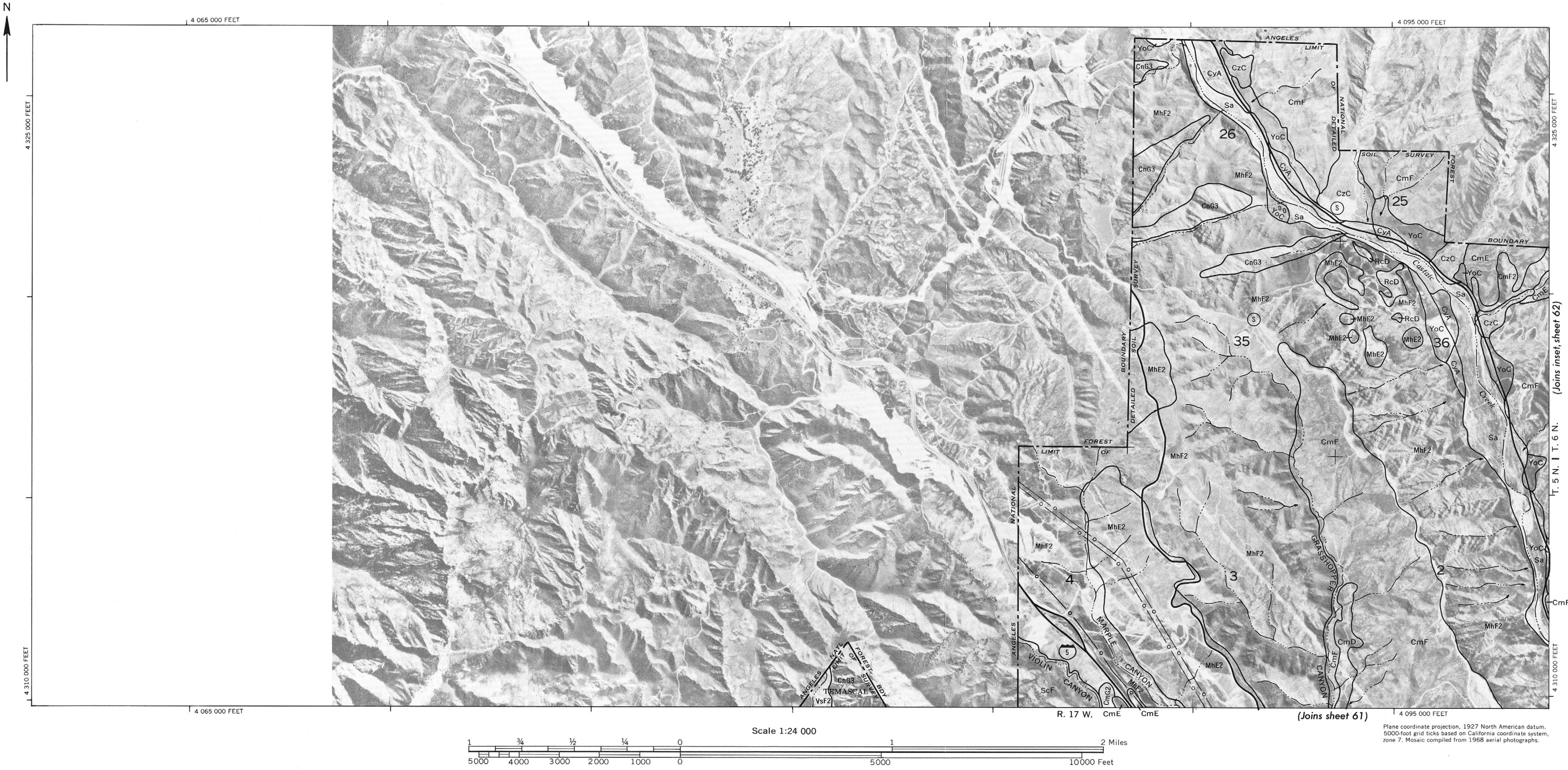


Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 60

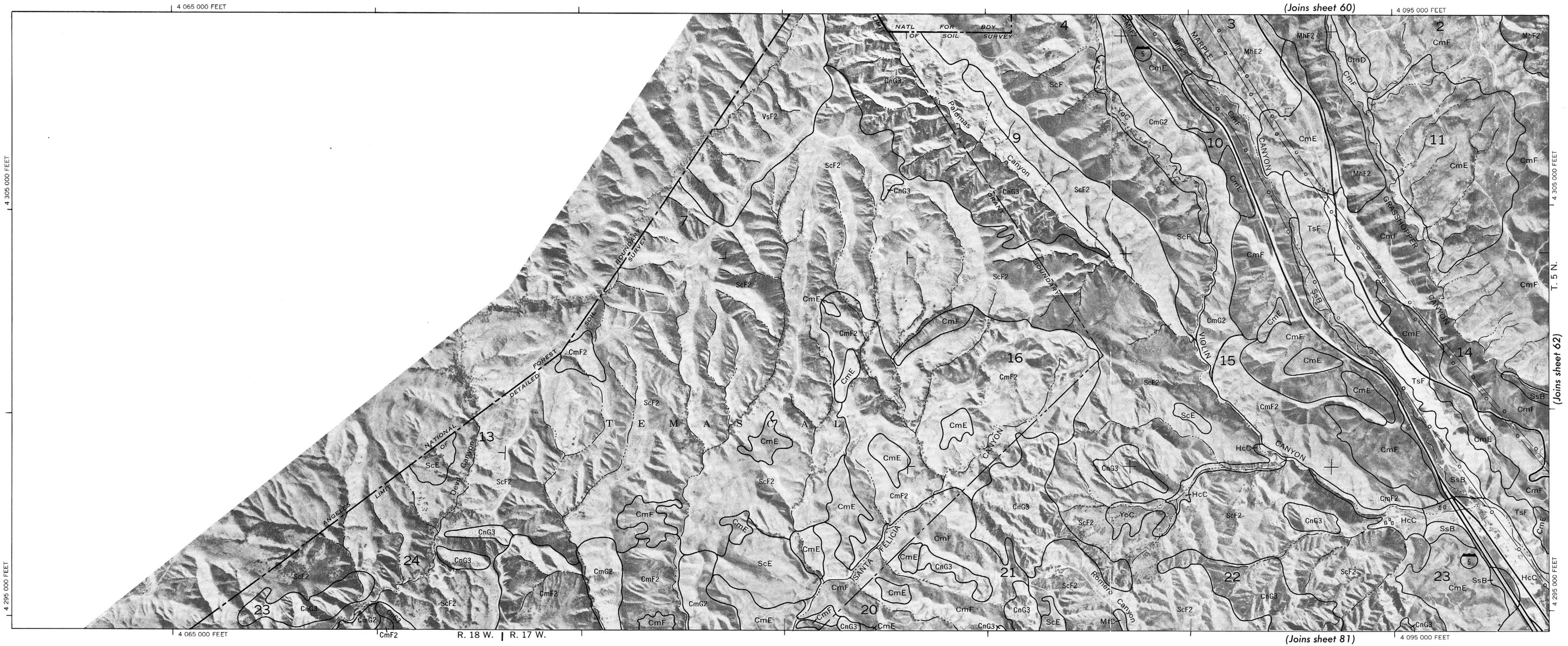
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 61



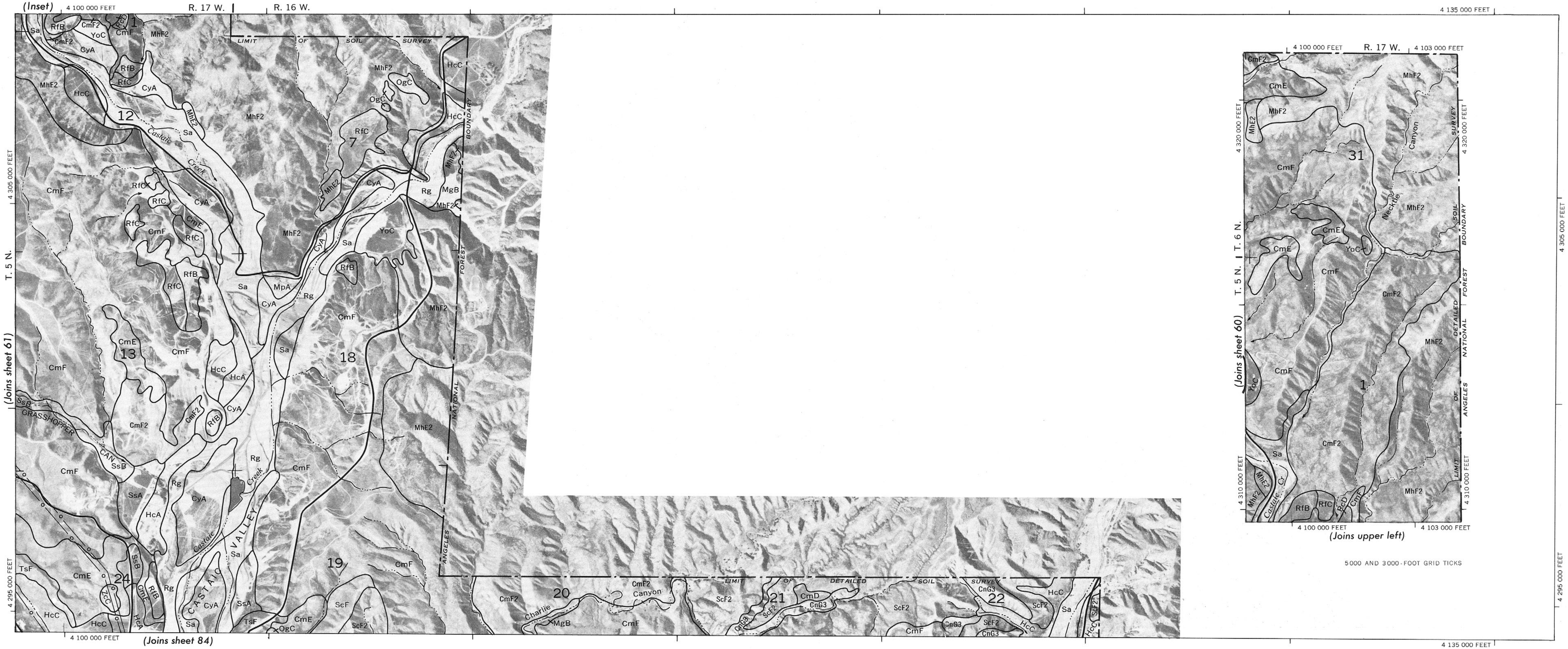
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

N



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 62

Land division corners are approximately positioned on this map.

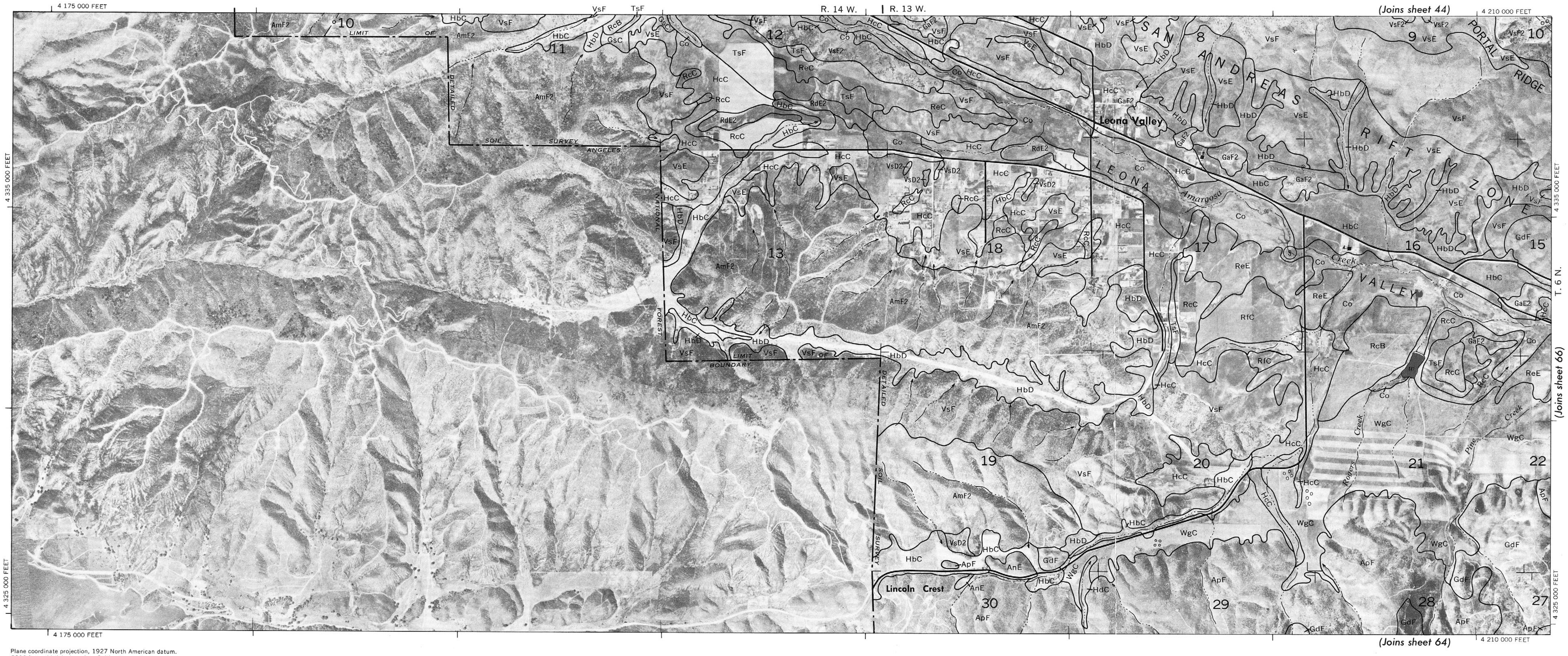
This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 63

N



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

N

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

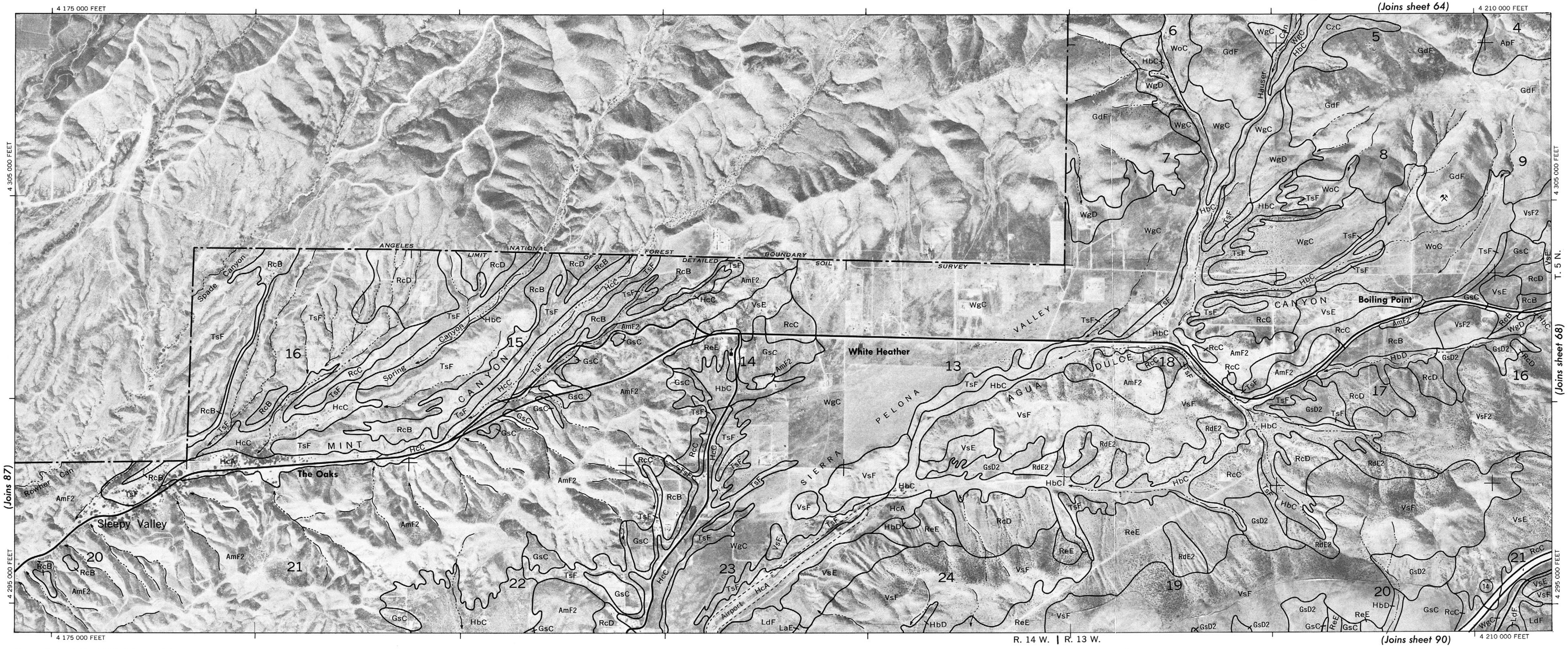
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 64

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

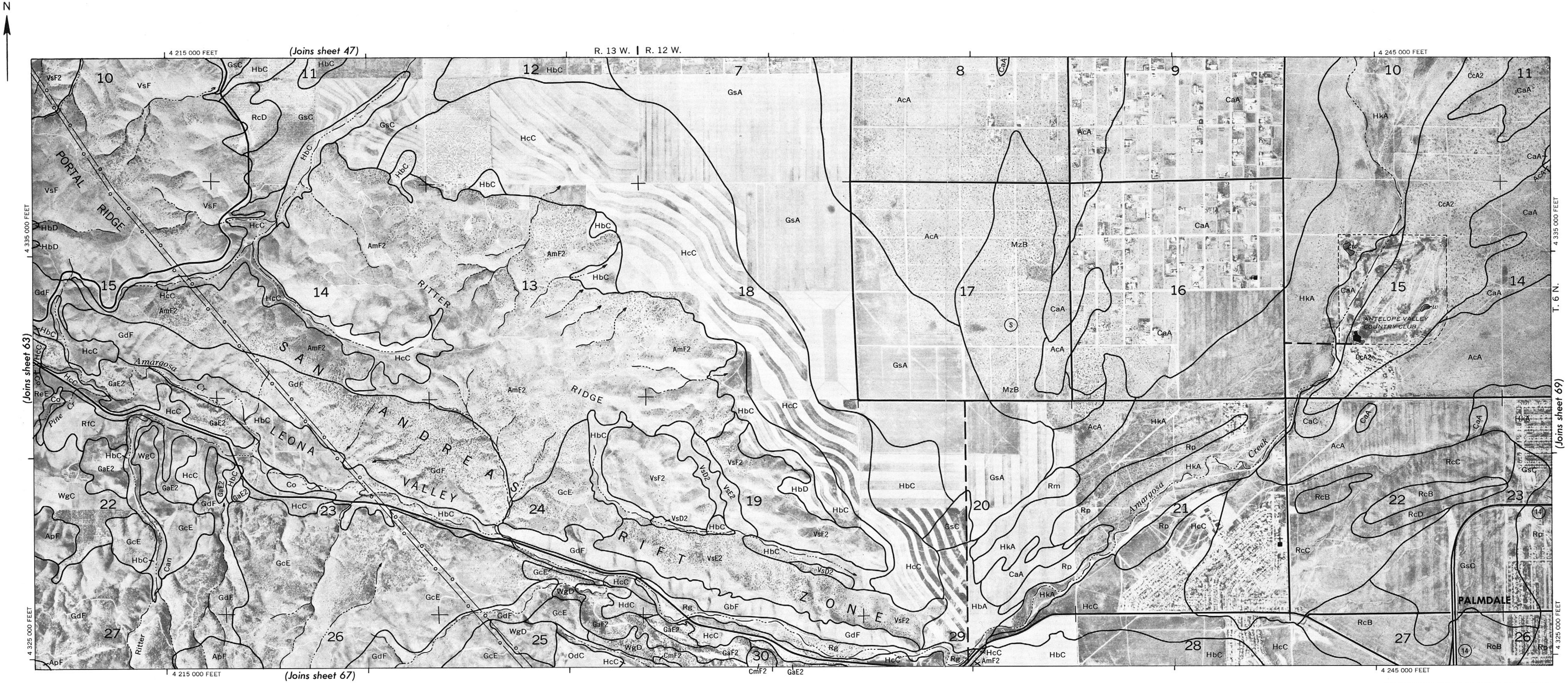
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 65



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 66

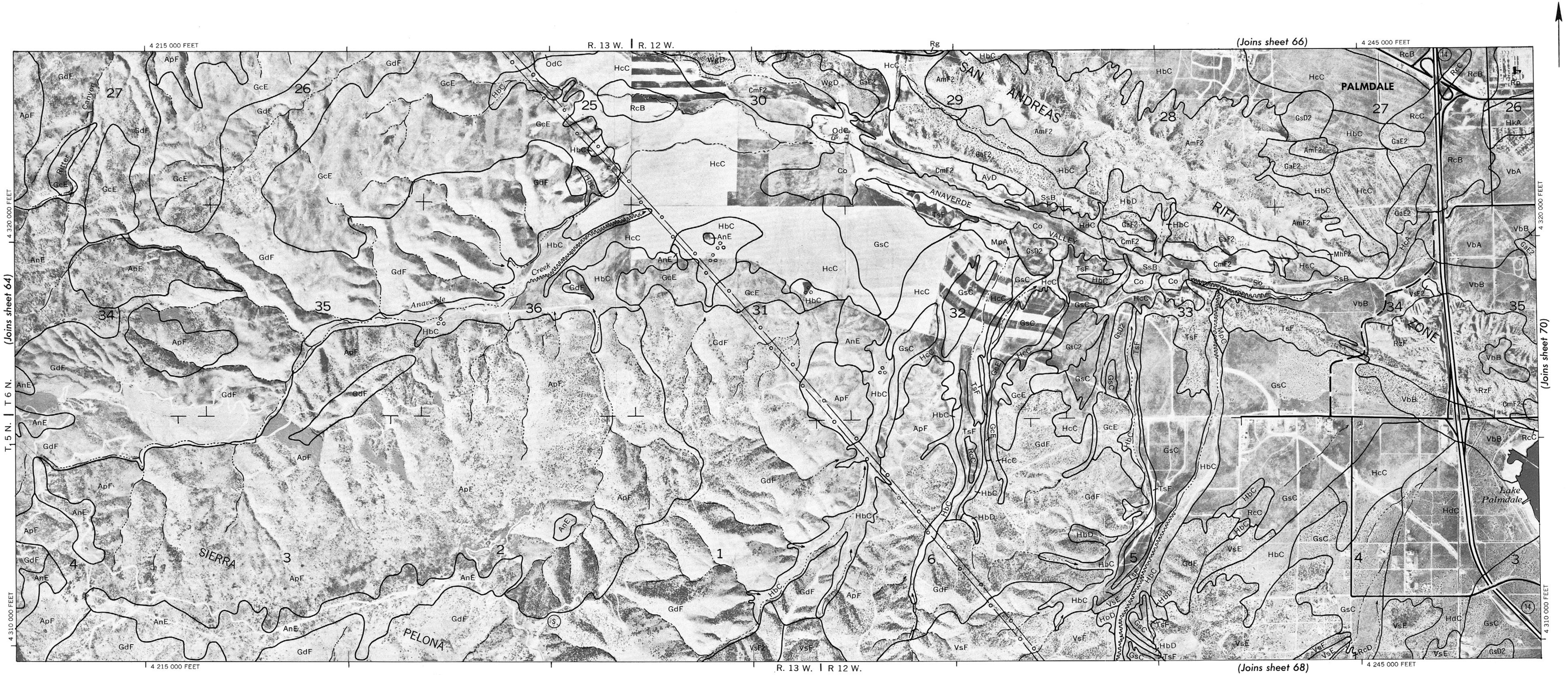
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

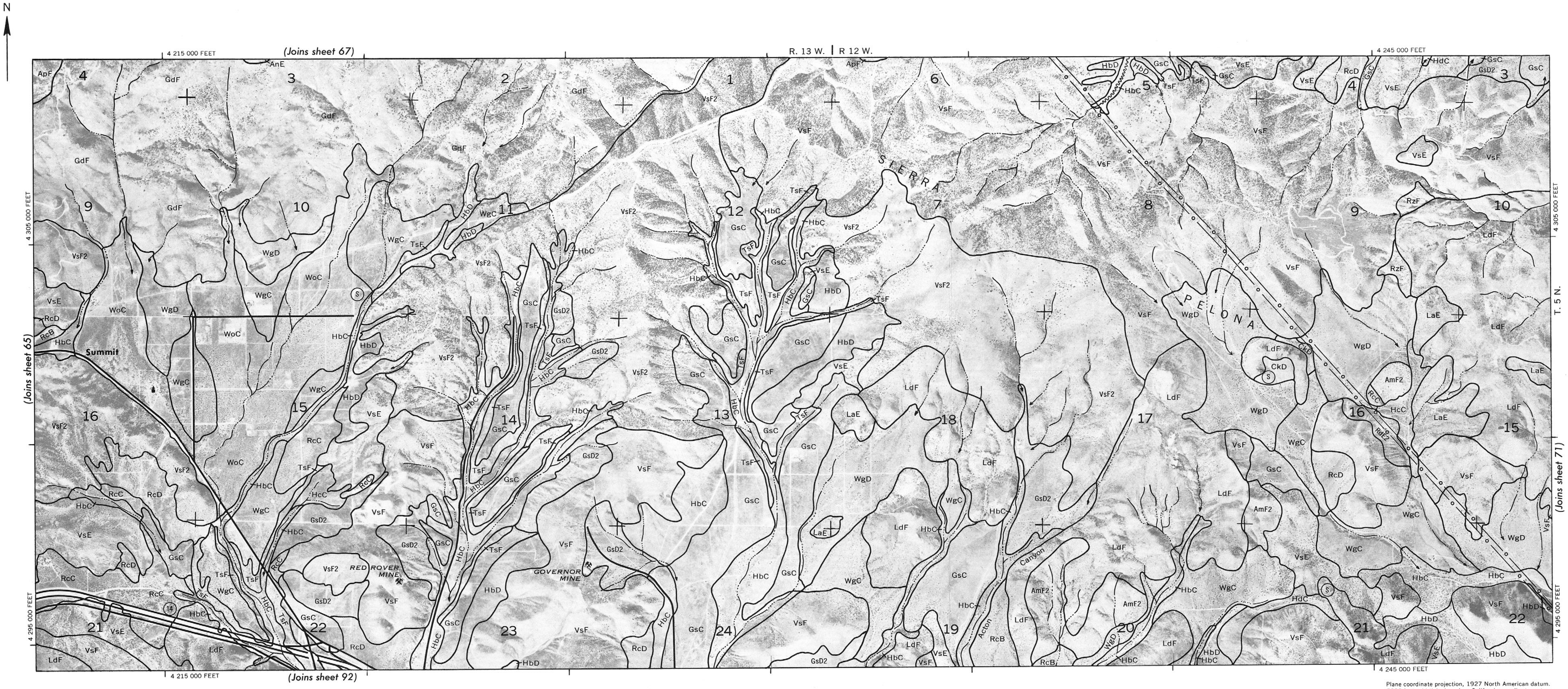
ANTELOPE VALLEY AREA, CALIFORNIA NO. 67



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 68



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

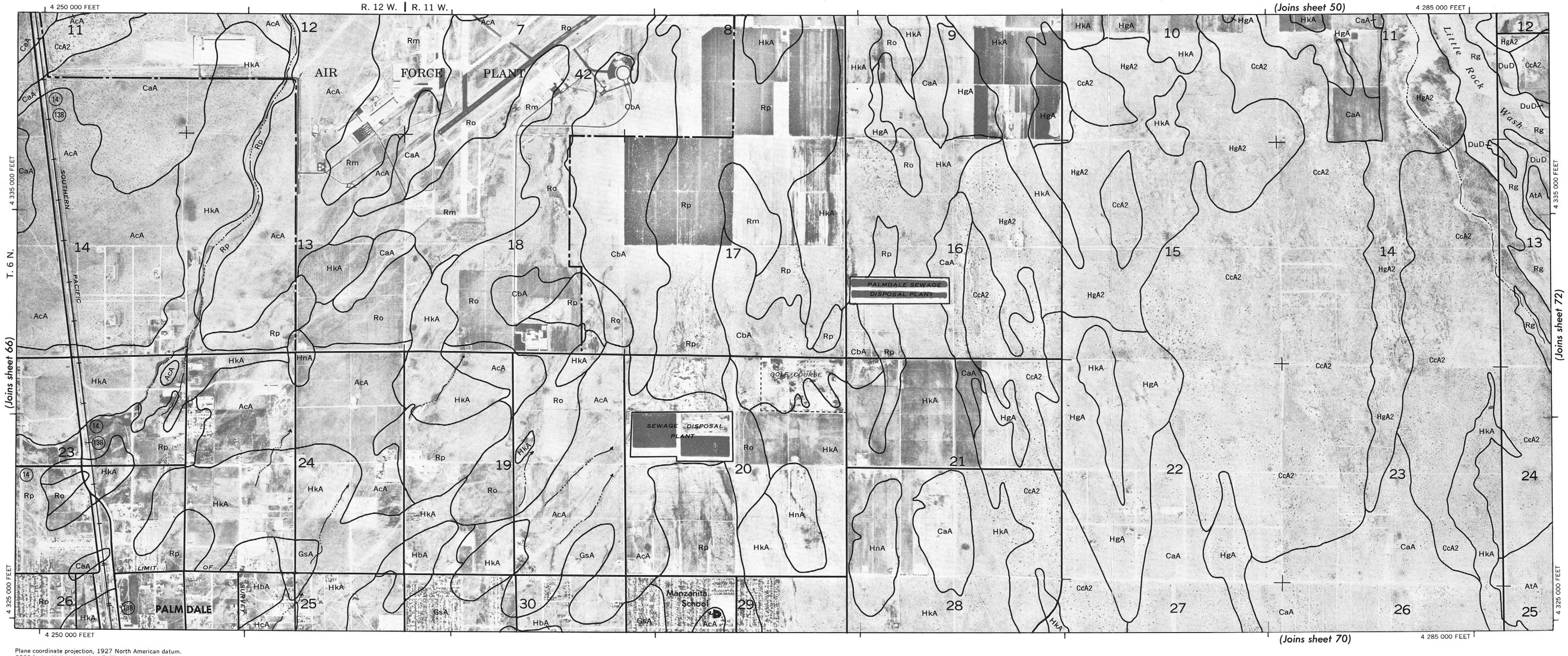
ANTELOPE VALLEY AREA, CALIFORNIA NO. 68

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 69



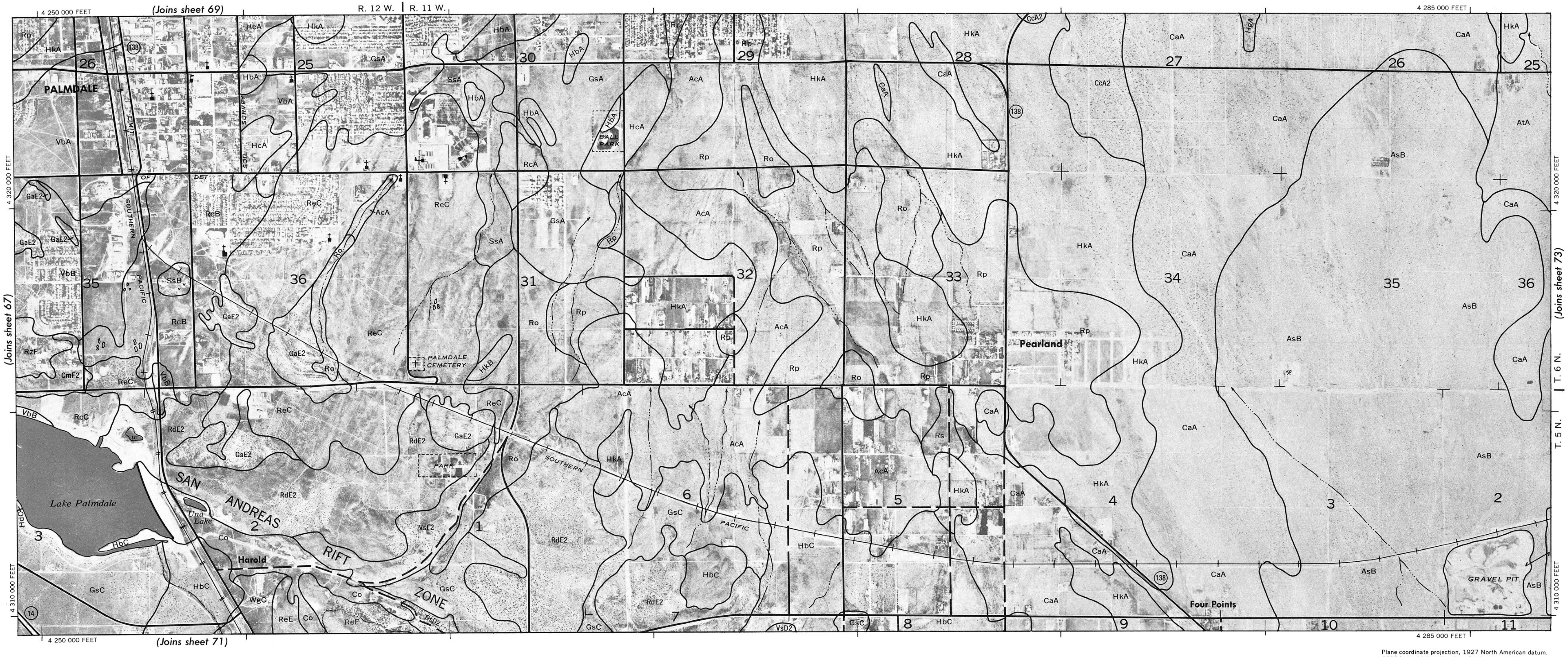
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

N



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 70

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

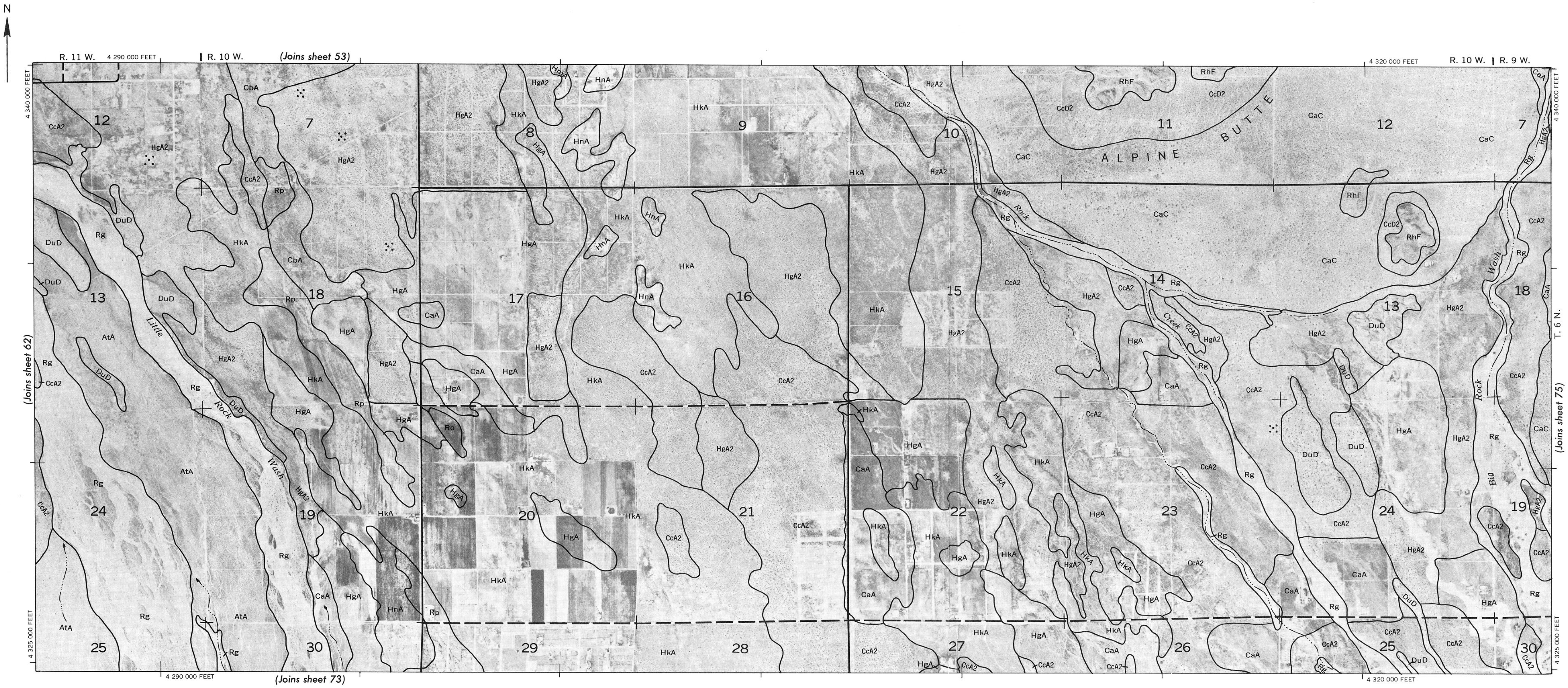
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

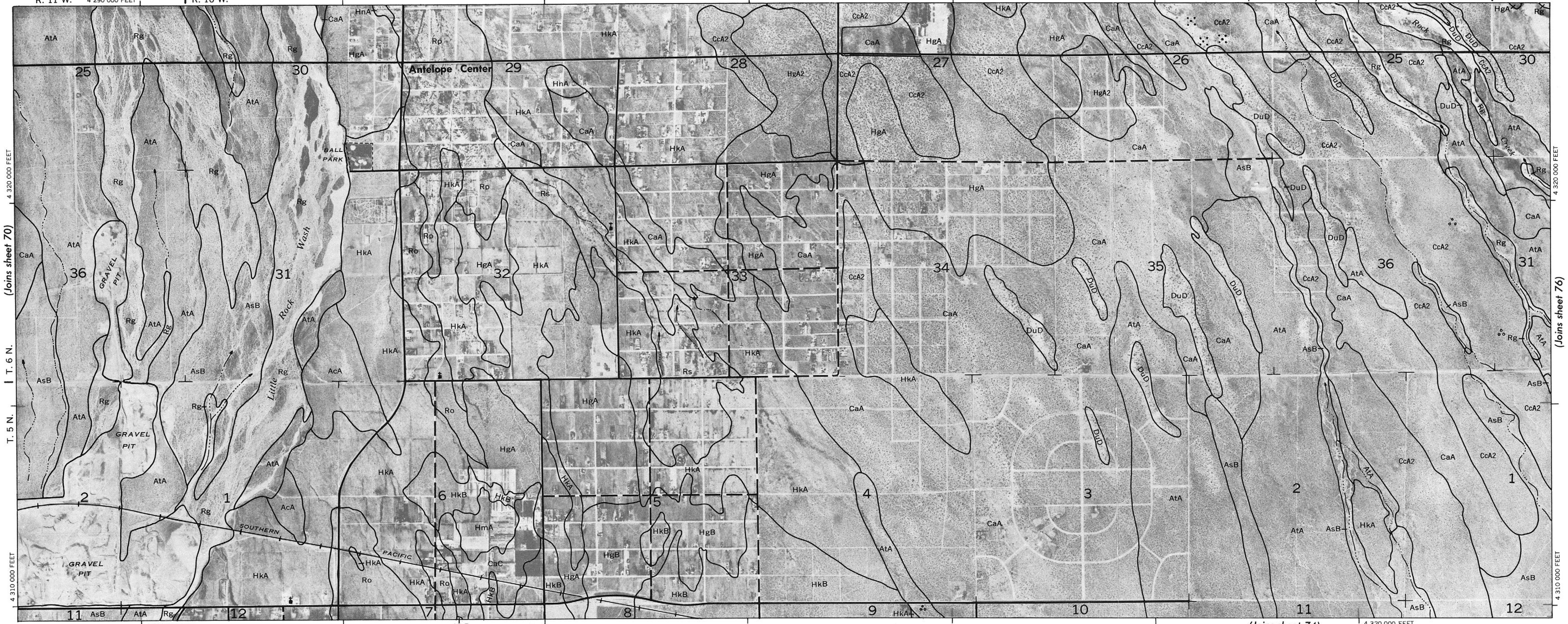
ANTELOPE VALLEY AREA, CALIFORNIA NO. 72

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N

R. 11 W. 4 290 000 FEET R. 10 W. (Joins sheet 72) 4 320 000 FEET R. 10 W. R. 9 W.



4 320 000 FEET (Joins sheet 70) T. 6 N. T. 5 N. 4 310 000 FEET

4 320 000 FEET (Joins sheet 76) 4 310 000 FEET

4 290 000 FEET HkB (Joins sheet 74) 4 320 000 FEET

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 73

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 74

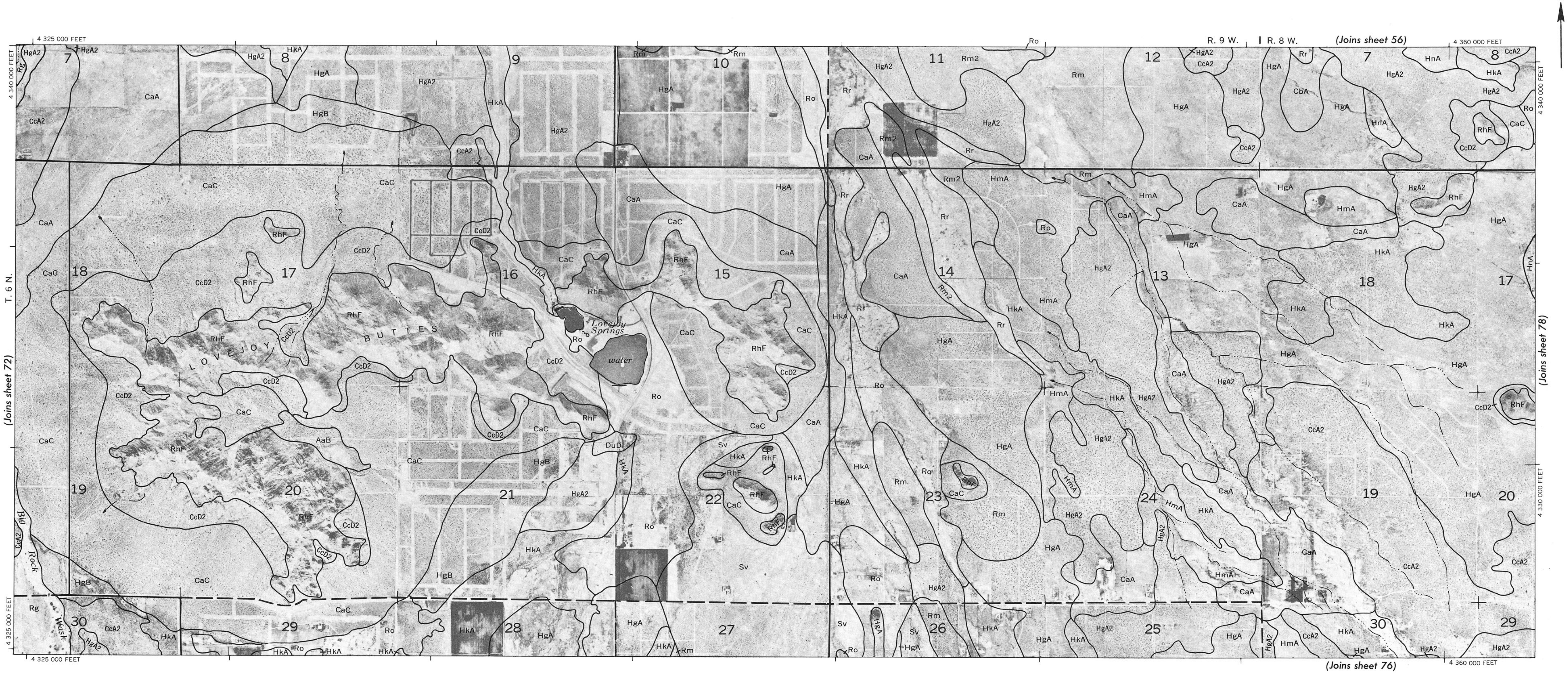
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 75



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 76

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 76

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

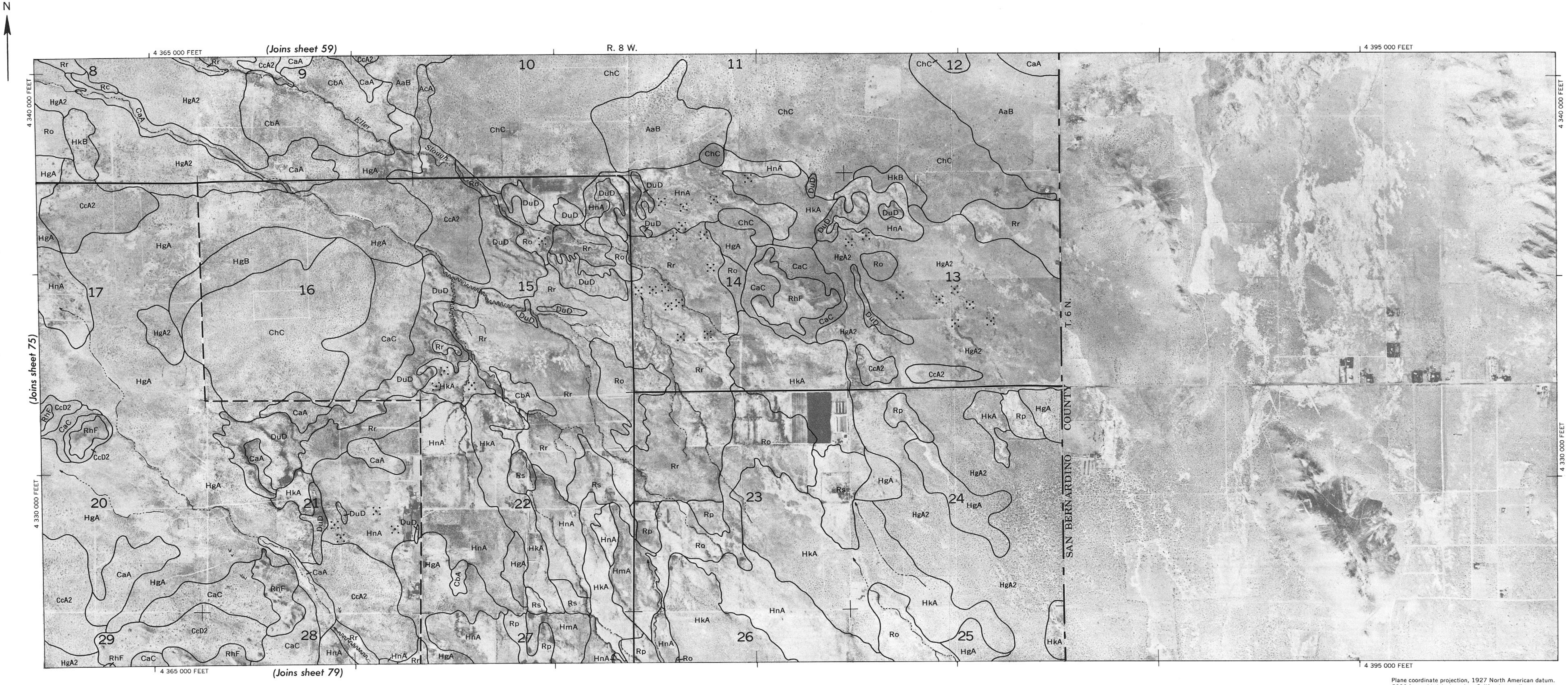
ANTELOPE VALLEY AREA, CALIFORNIA NO. 77

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 78

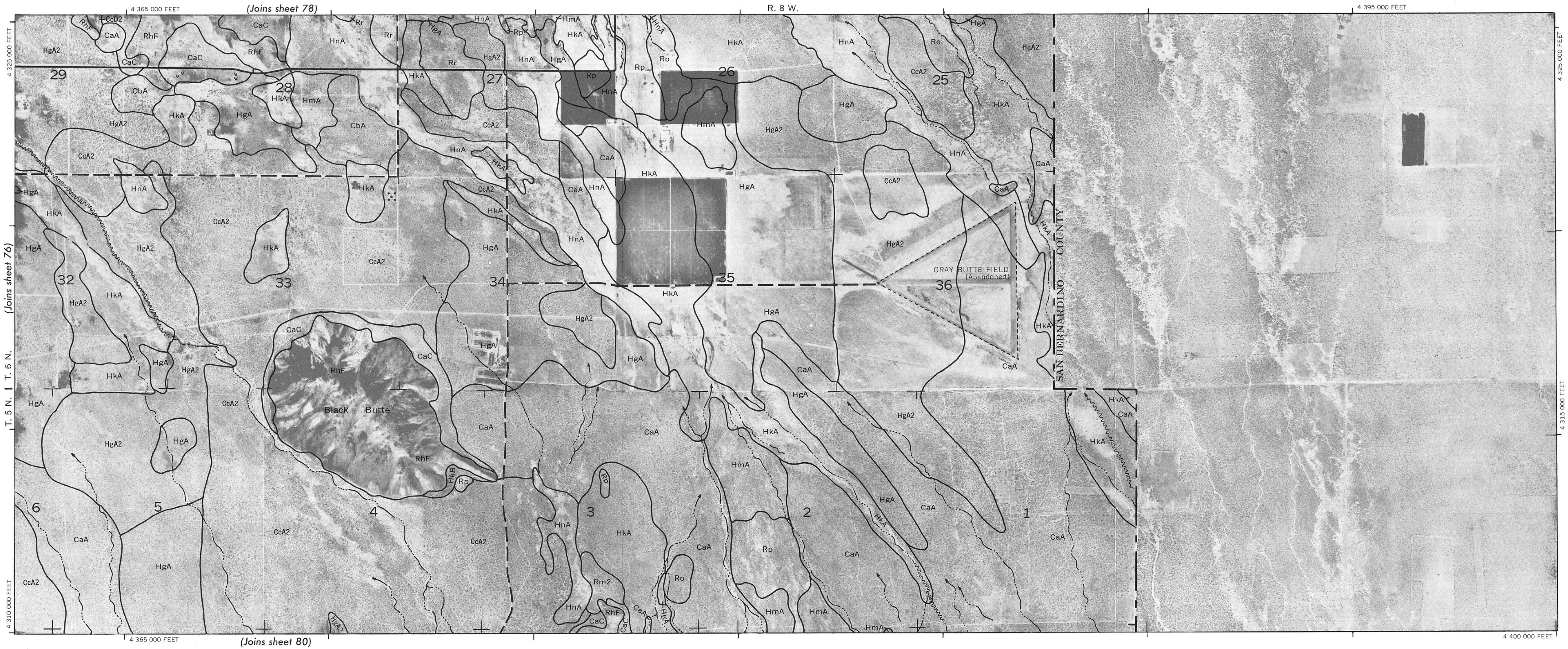
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 79

N



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 80

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

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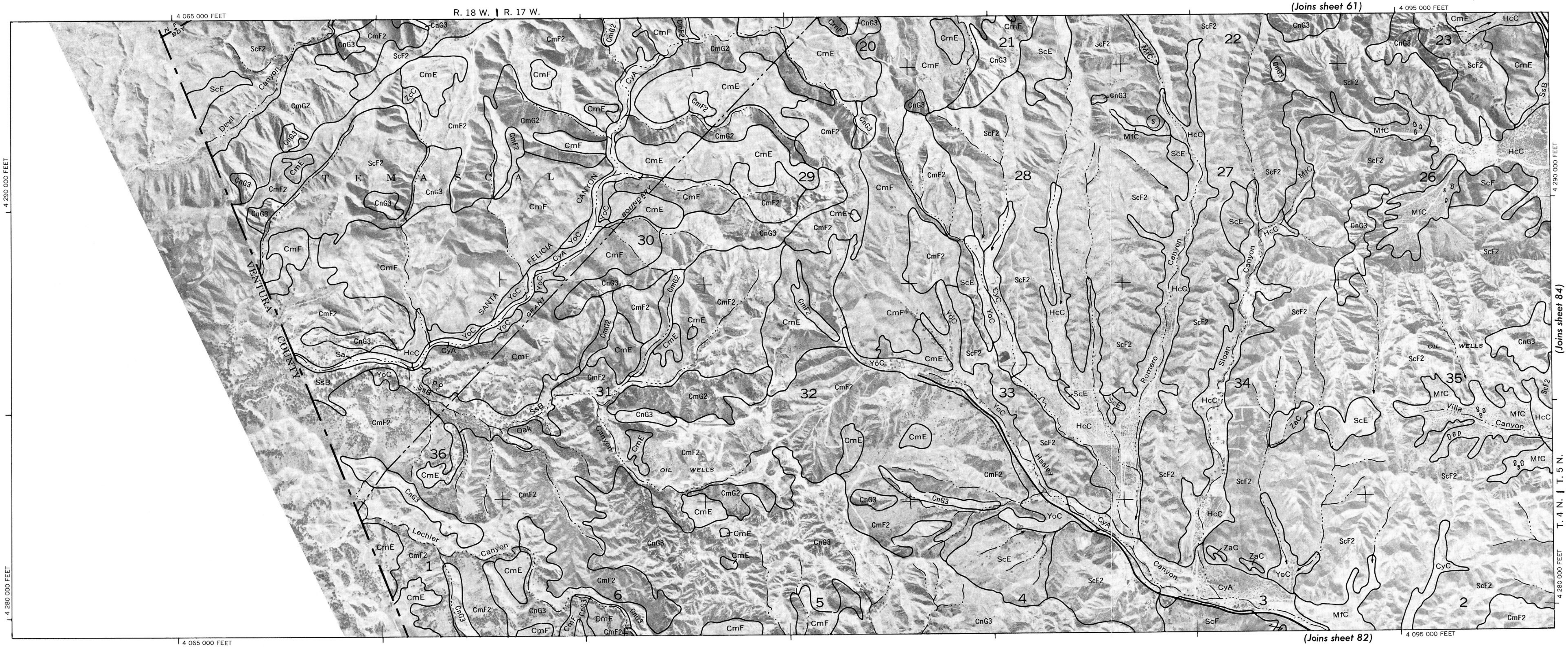
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 81



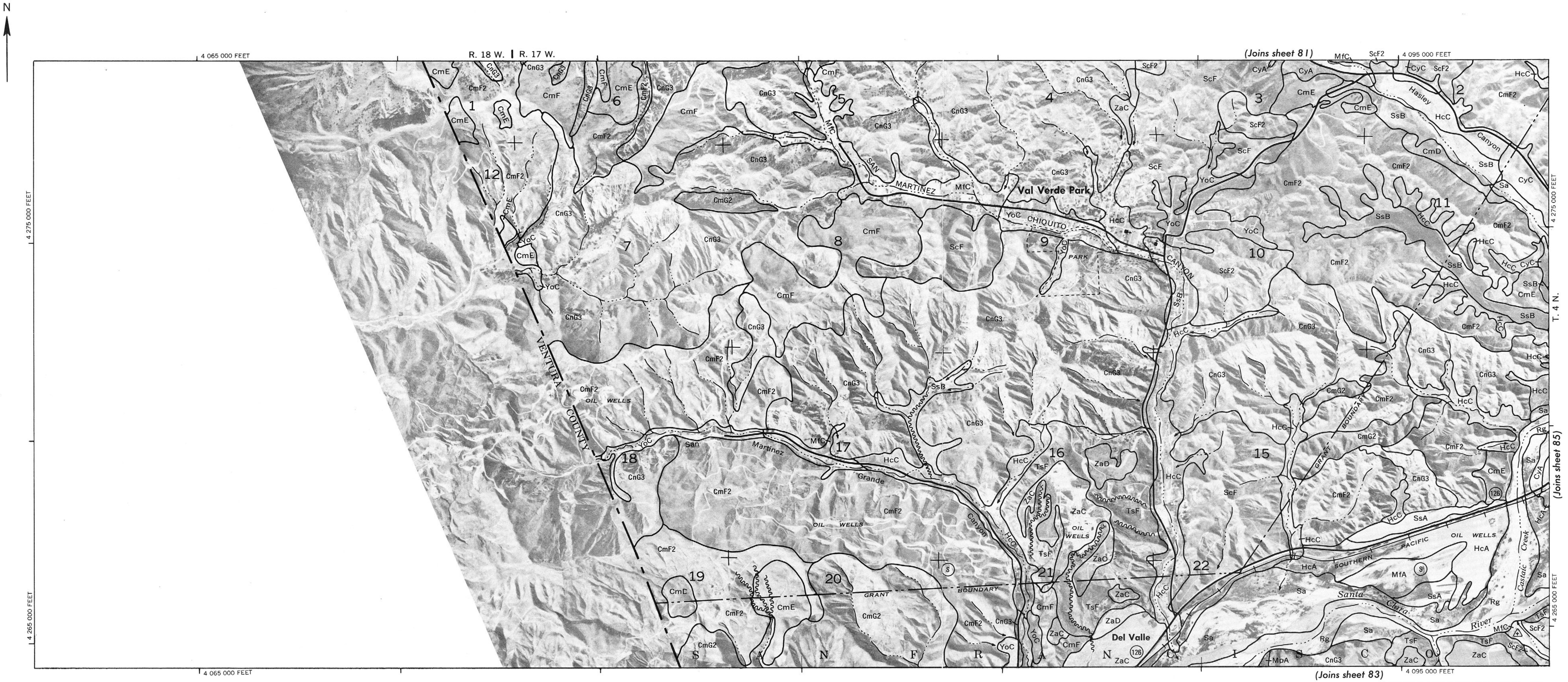
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 82



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 82

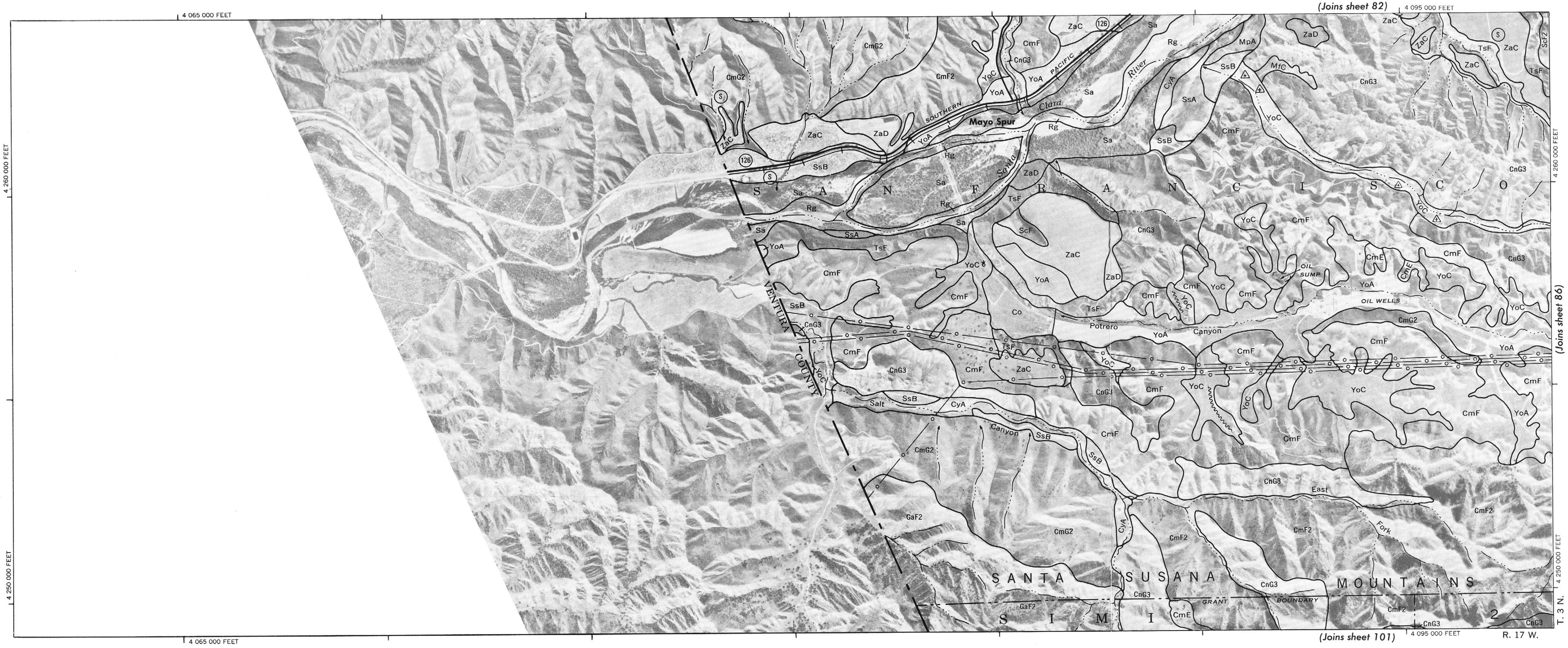
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 83

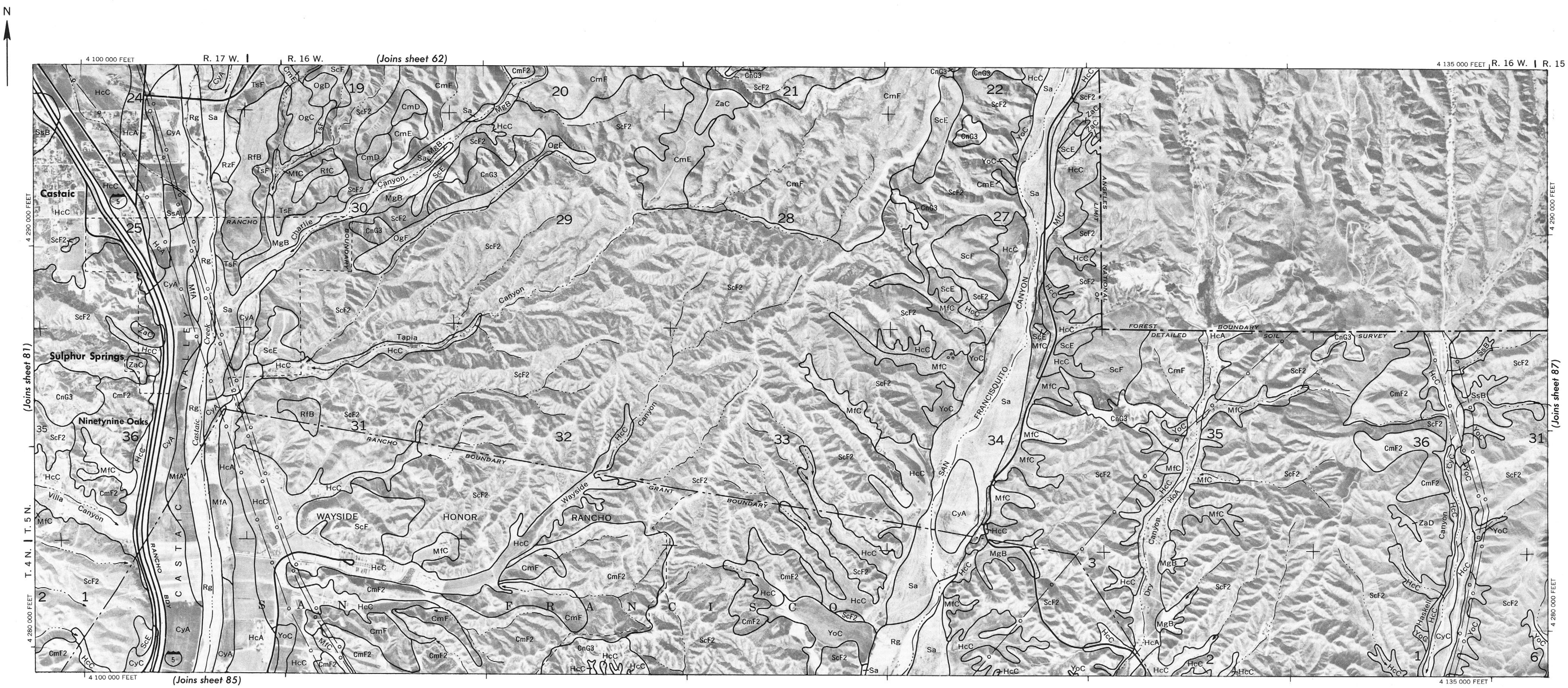


Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

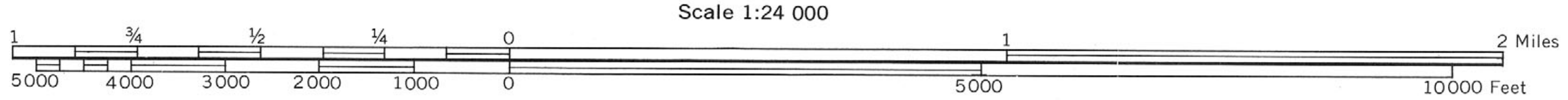
Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.



ANTELOPE VALLEY AREA, CALIFORNIA NO. 84

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

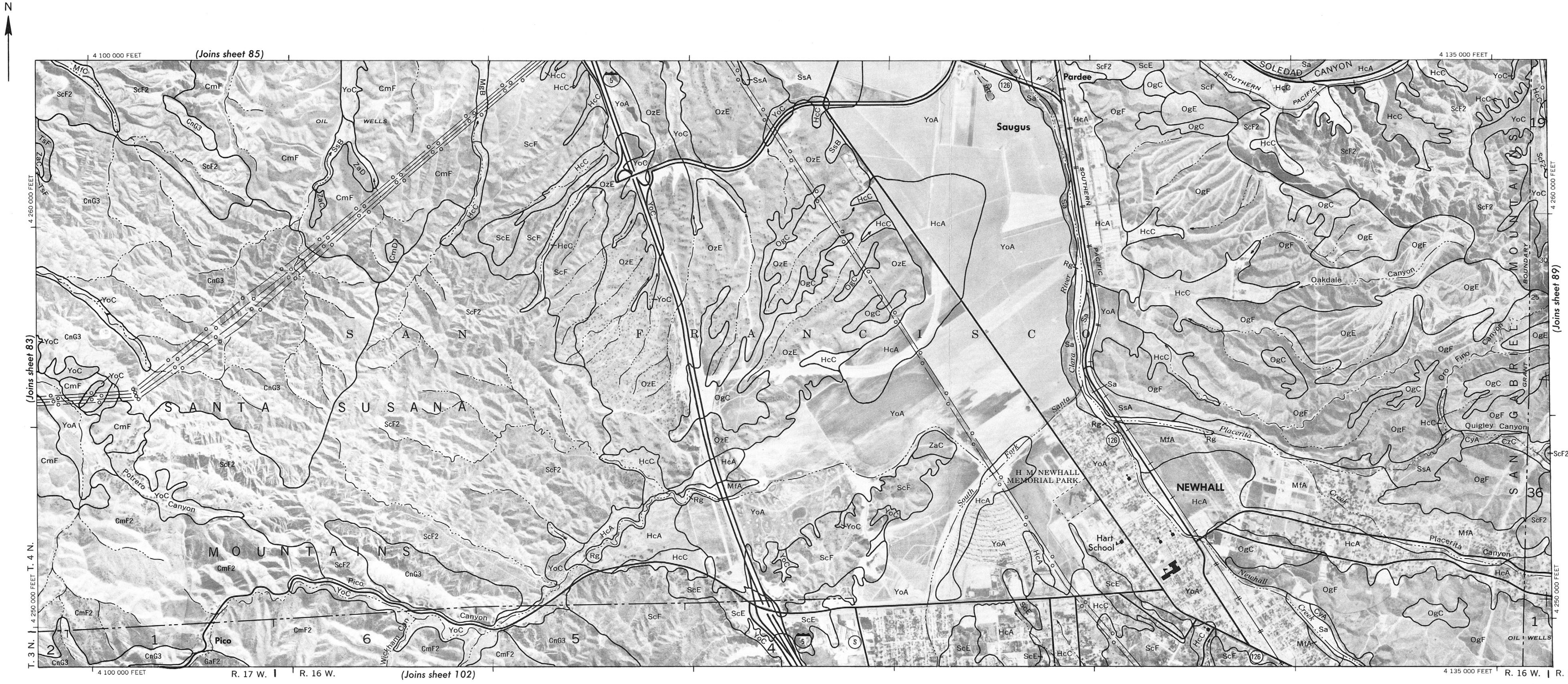
ANTELOPE VALLEY AREA, CALIFORNIA NO. 85

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 86



Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

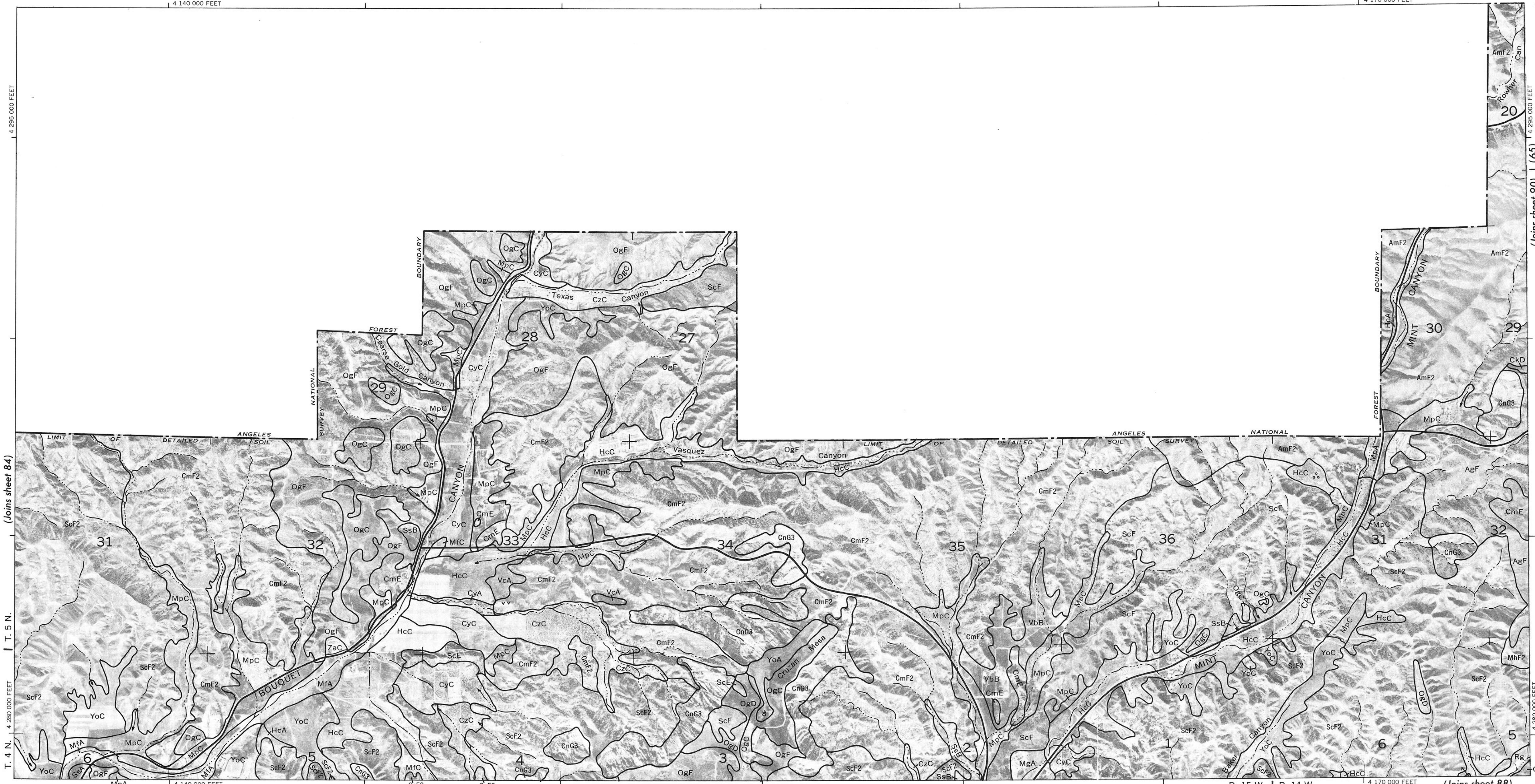
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 86

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

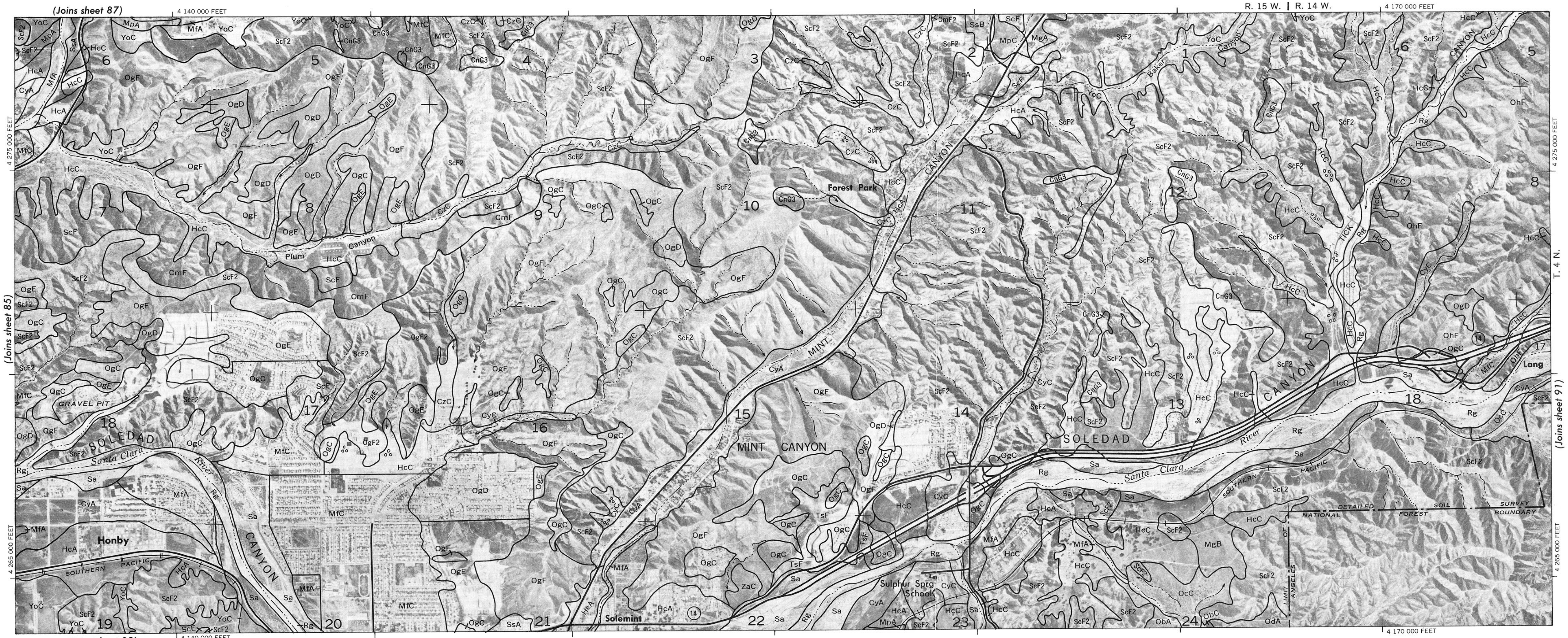
This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 87

N

(Joins sheet 87)



(Joins sheet 85)

(Joins sheet 91)

(Joins sheet 89)

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 88

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

89

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 89

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 90

N

(Joins sheet 65)

4 175 000 FEET

R. 14 W. | R. 13 W.

4 210 000 FEET

(Joins sheet 87)

4 290 000 FEET

4 280 000 FEET

(Joins sheet 92)

T. 5 N. | T. 4 N.

4 175 000 FEET

(Joins sheet 91)

4 210 000 FEET

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

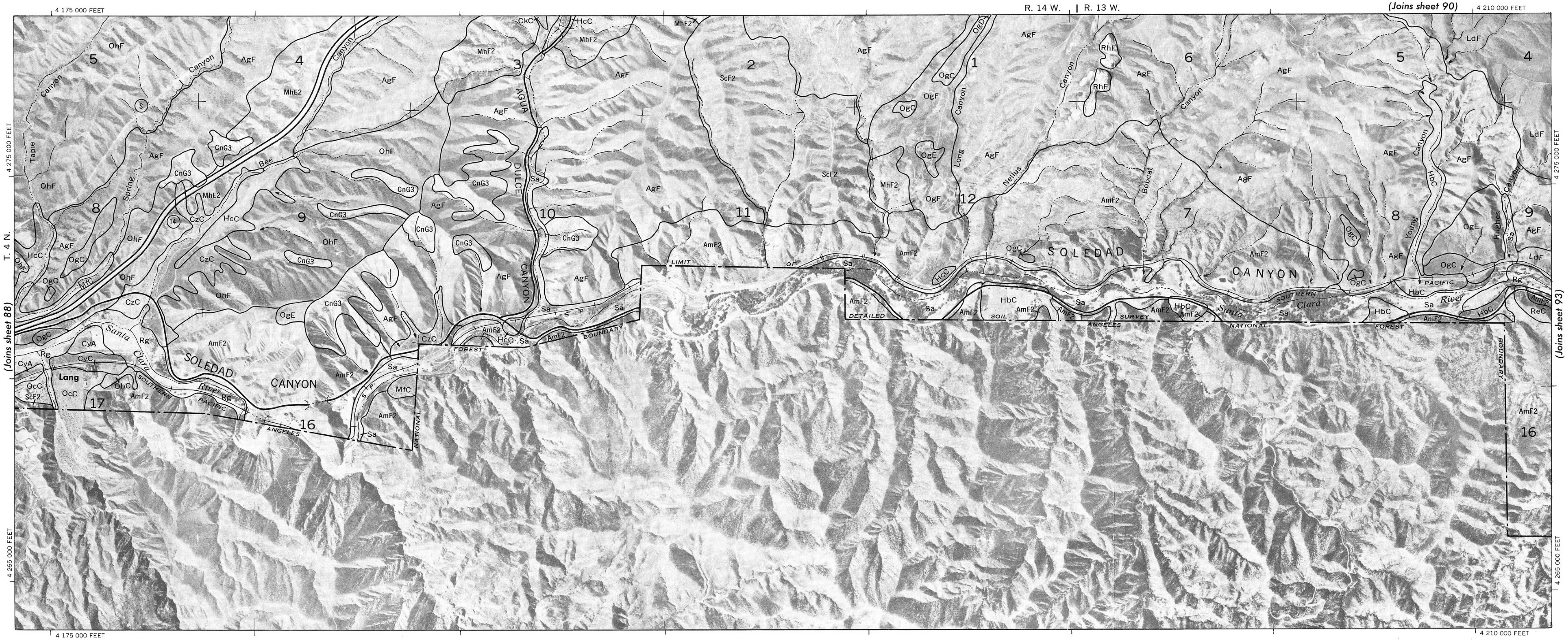
5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 90

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
ANTELOPE VALLEY AREA, CALIFORNIA NO. 91



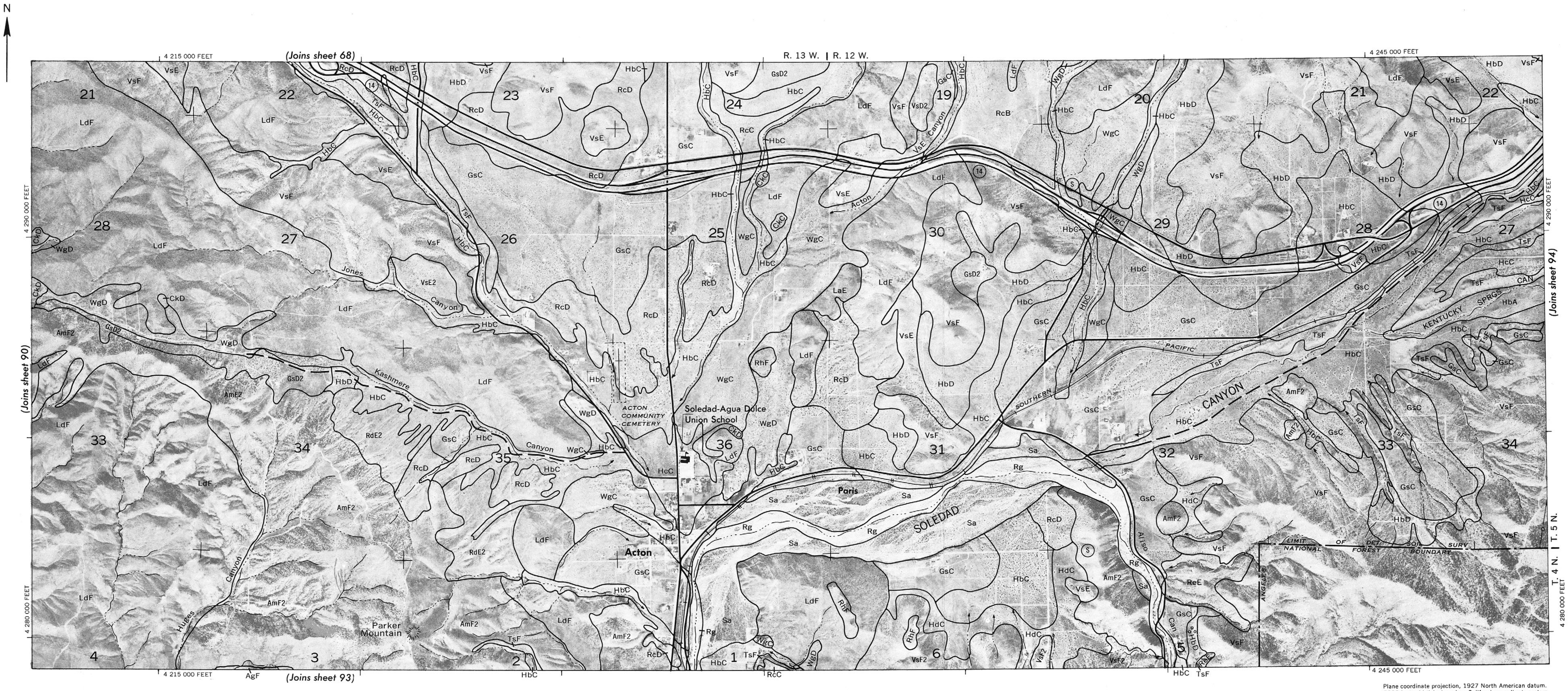
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

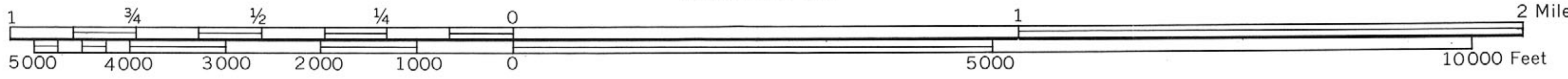
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 92



Scale 1:24 000



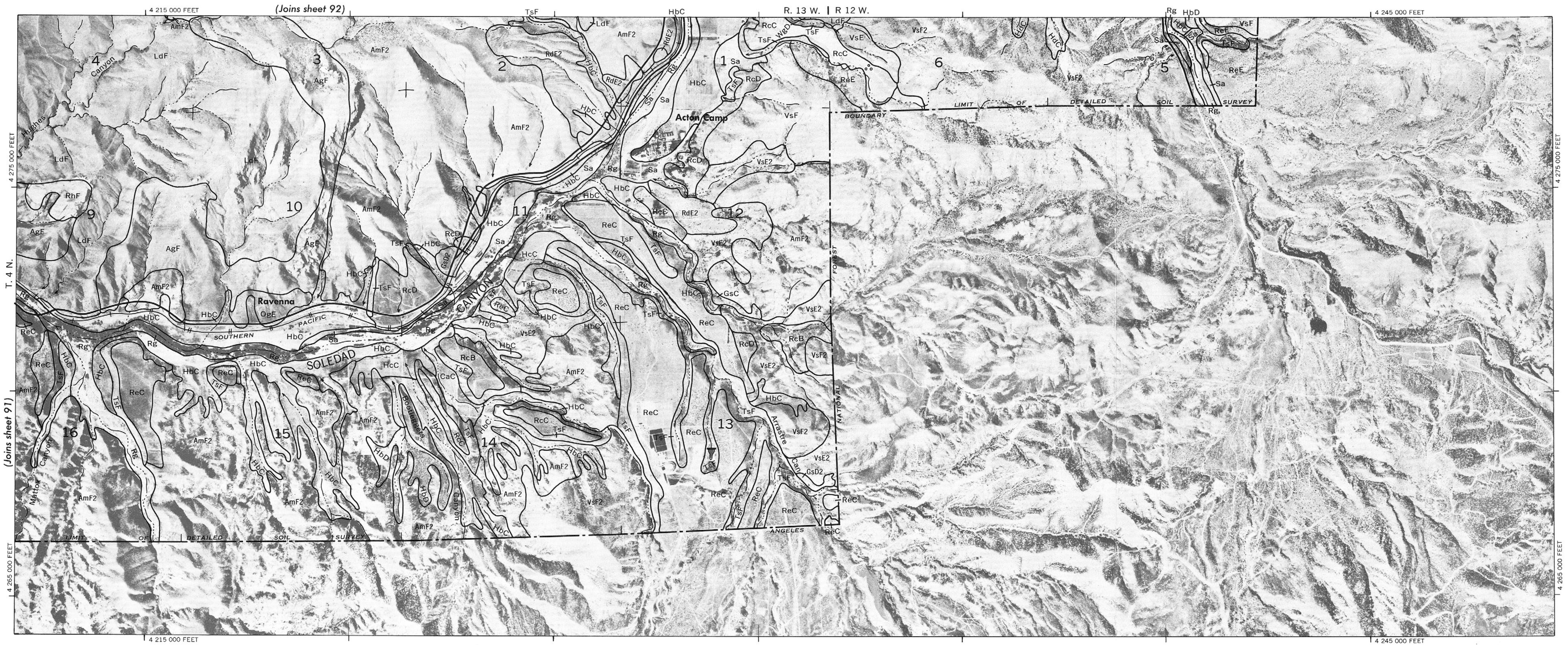
Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 92

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

N



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

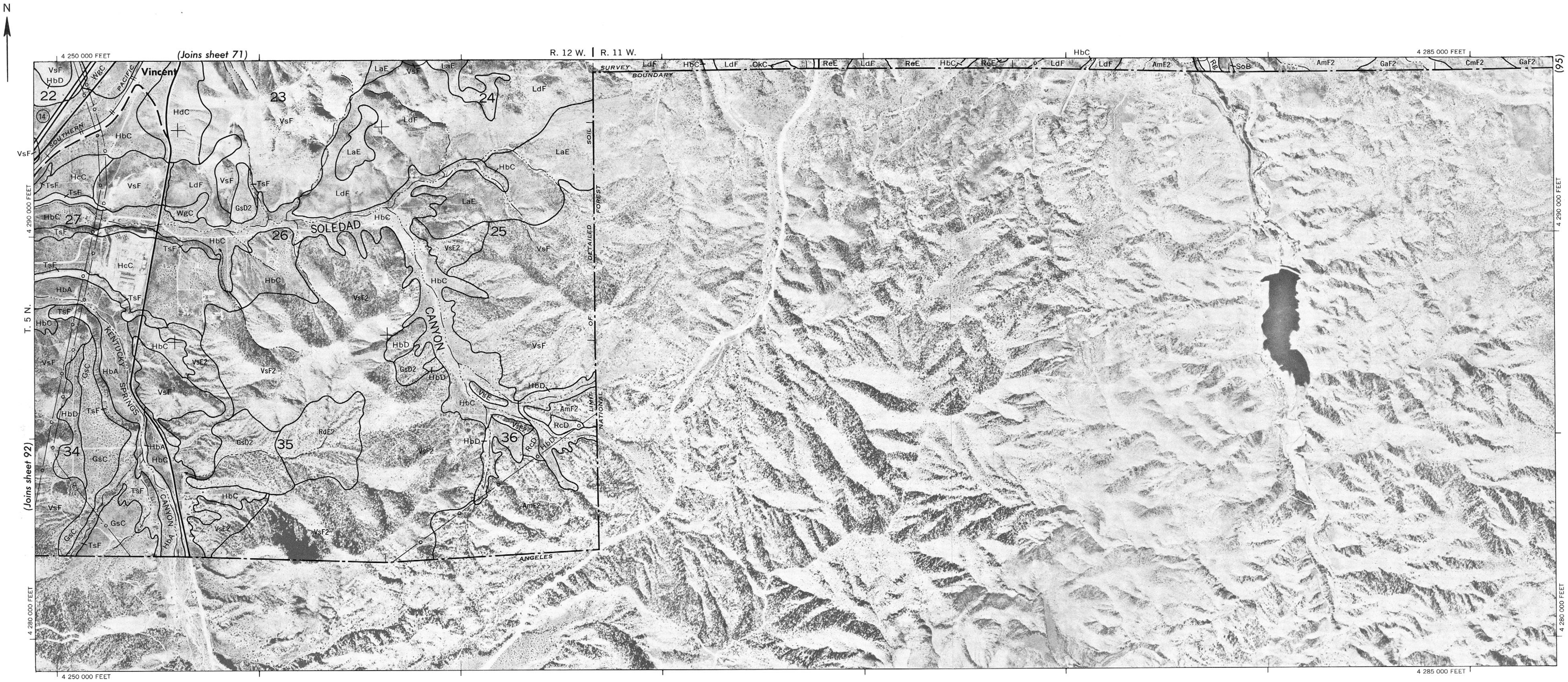
1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 93



ANTELOPE VALLEY AREA, CALIFORNIA NO. 94

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

N

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 95

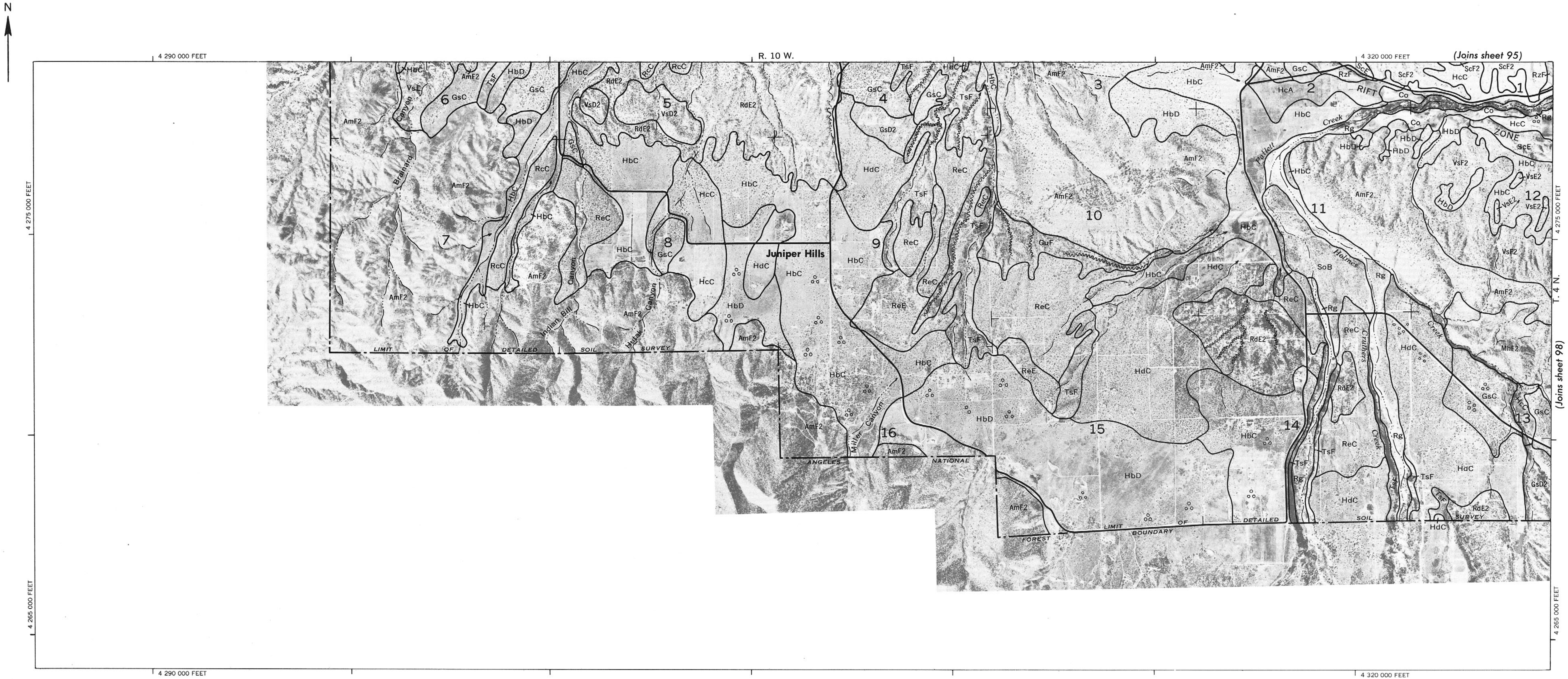
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA — SHEET NUMBER 96



Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 96

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 97

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 98

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

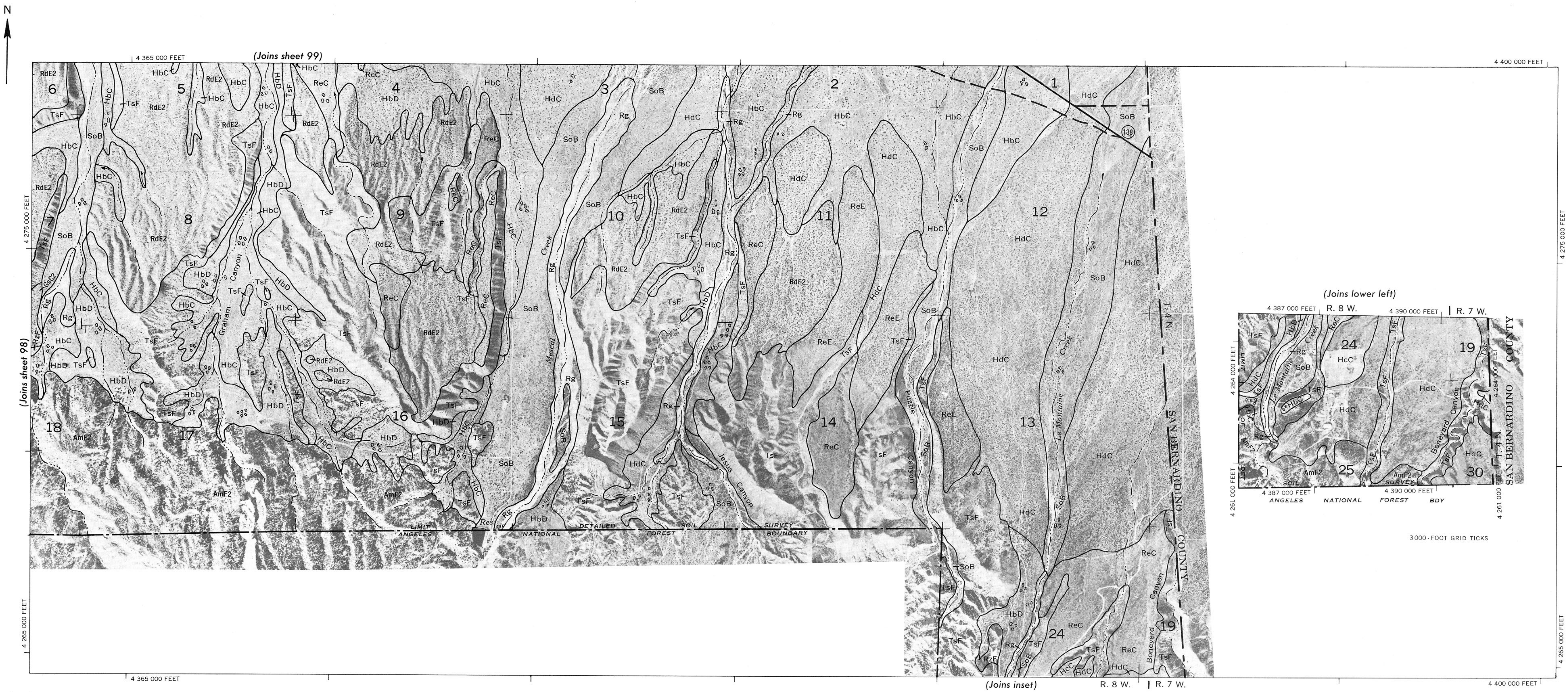
Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.
Land division corners are approximately positioned on this map.



Plane coordinate projection, 1927 North American datum.
5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

ANTELOPE VALLEY AREA, CALIFORNIA NO. 100

Land division corners are approximately positioned on this map.

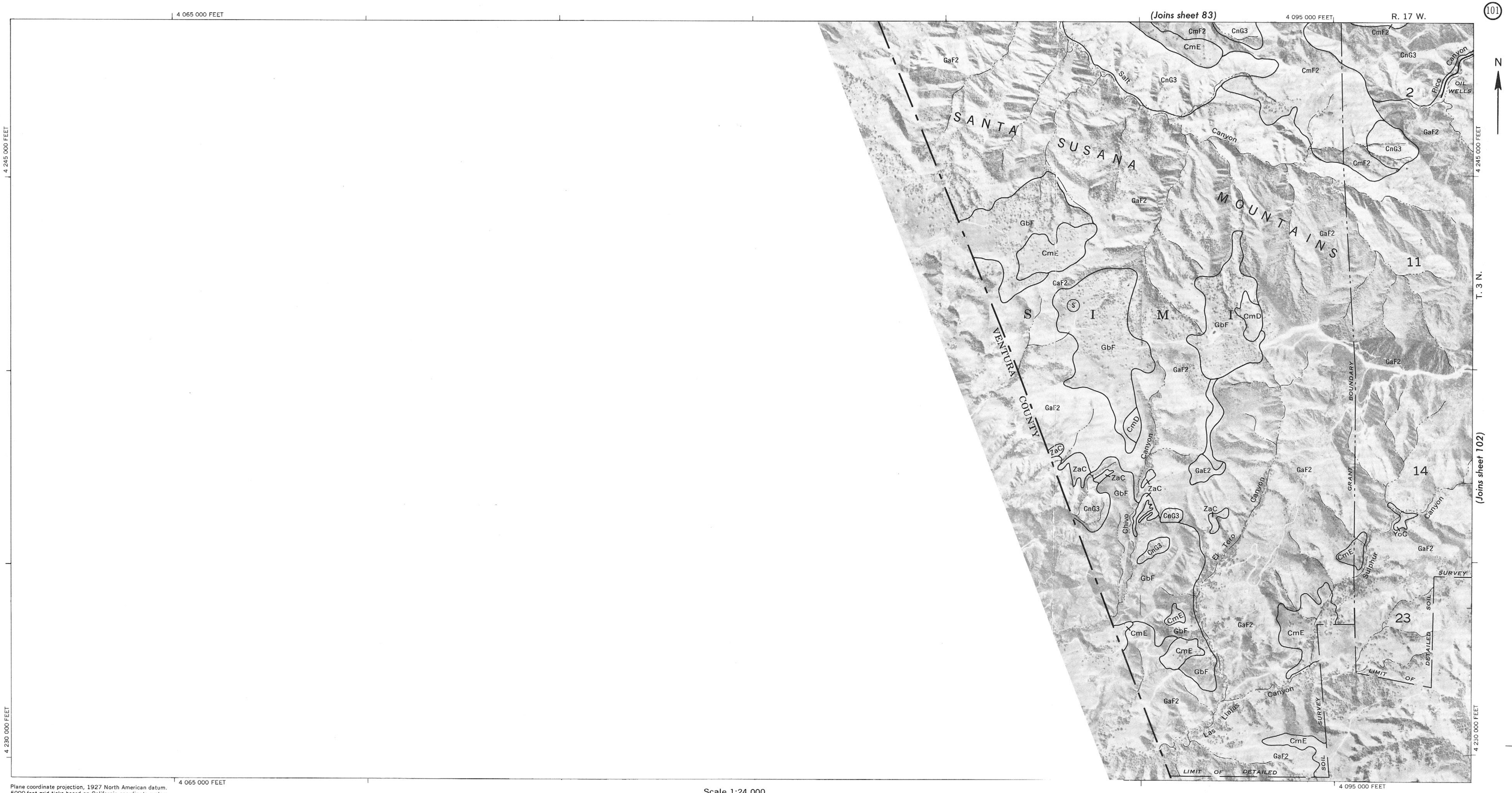
This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 101

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

Scale 1:24 000



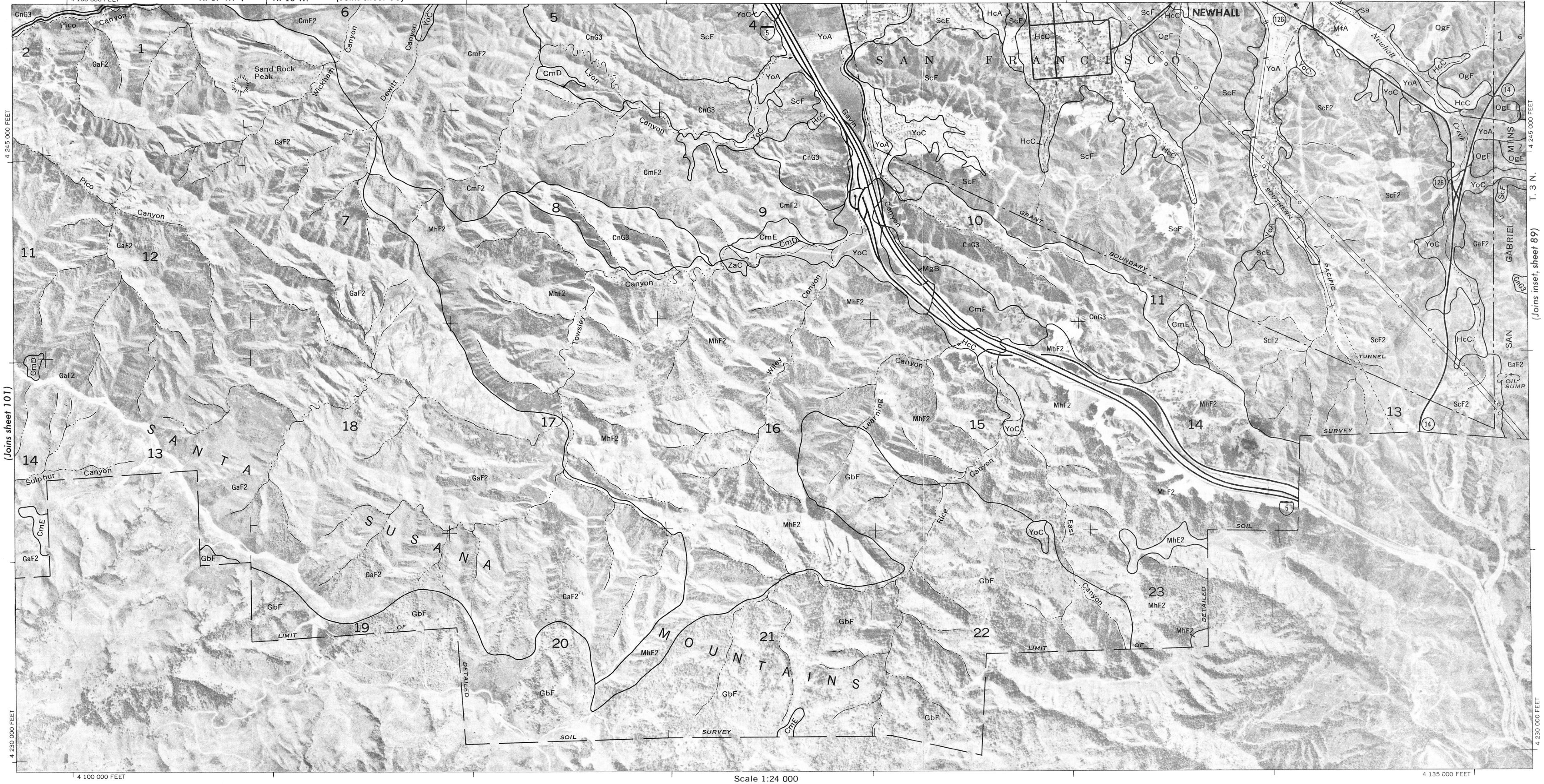
Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

(Joins sheet 86)



(Joins sheet 101)

(Joins inset, sheet 89)

Scale 1:24 000

1 ¾ ½ ¼ 0 1 2 Miles

5000 4000 3000 2000 1000 0 5000 10000 Feet

Plane coordinate projection, 1927 North American datum. 5000-foot grid ticks based on California coordinate system, zone 7. Mosaic compiled from 1968 aerial photographs.

ANTELOPE VALLEY AREA, CALIFORNIA NO. 102

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1969 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of California Agricultural Experiment Station.

SOIL LIMITATIONS FOR SEPTIC TANK FILTER FIELDS

East Half

ANTELOPE VALLEY AREA

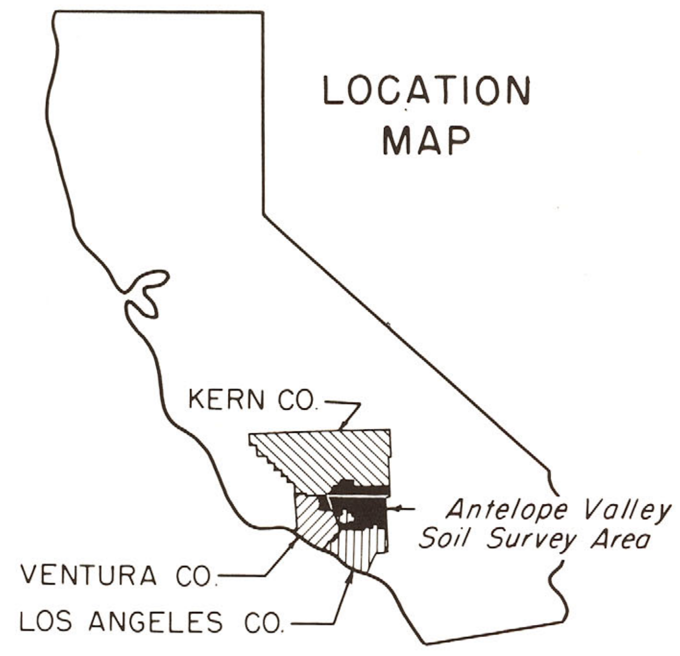
CALIFORNIA

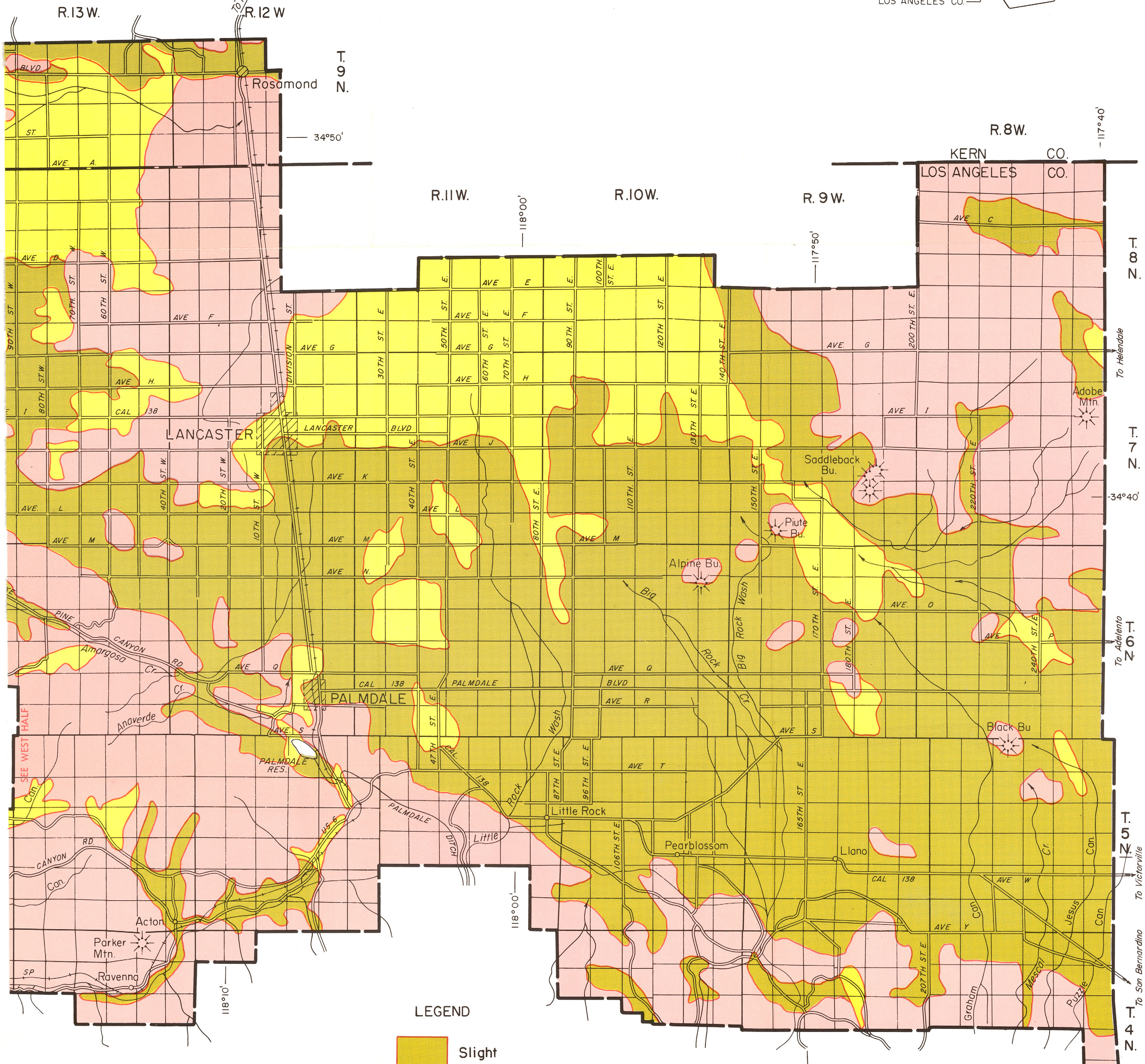
AUGUST 1969

2 0 2 4 6

SCALE IN MILES

SCALE 1:126,720





LEGEND

- Slight
- Moderate
- Severe

For definition of degrees of limitation see section on "Use of the Soils For Recreation and Related Purposes in the Soil Survey of the Antelope Valley Area, California".

This map was prepared from detailed soil maps and generalized to the scale of 2 miles equals one inch.

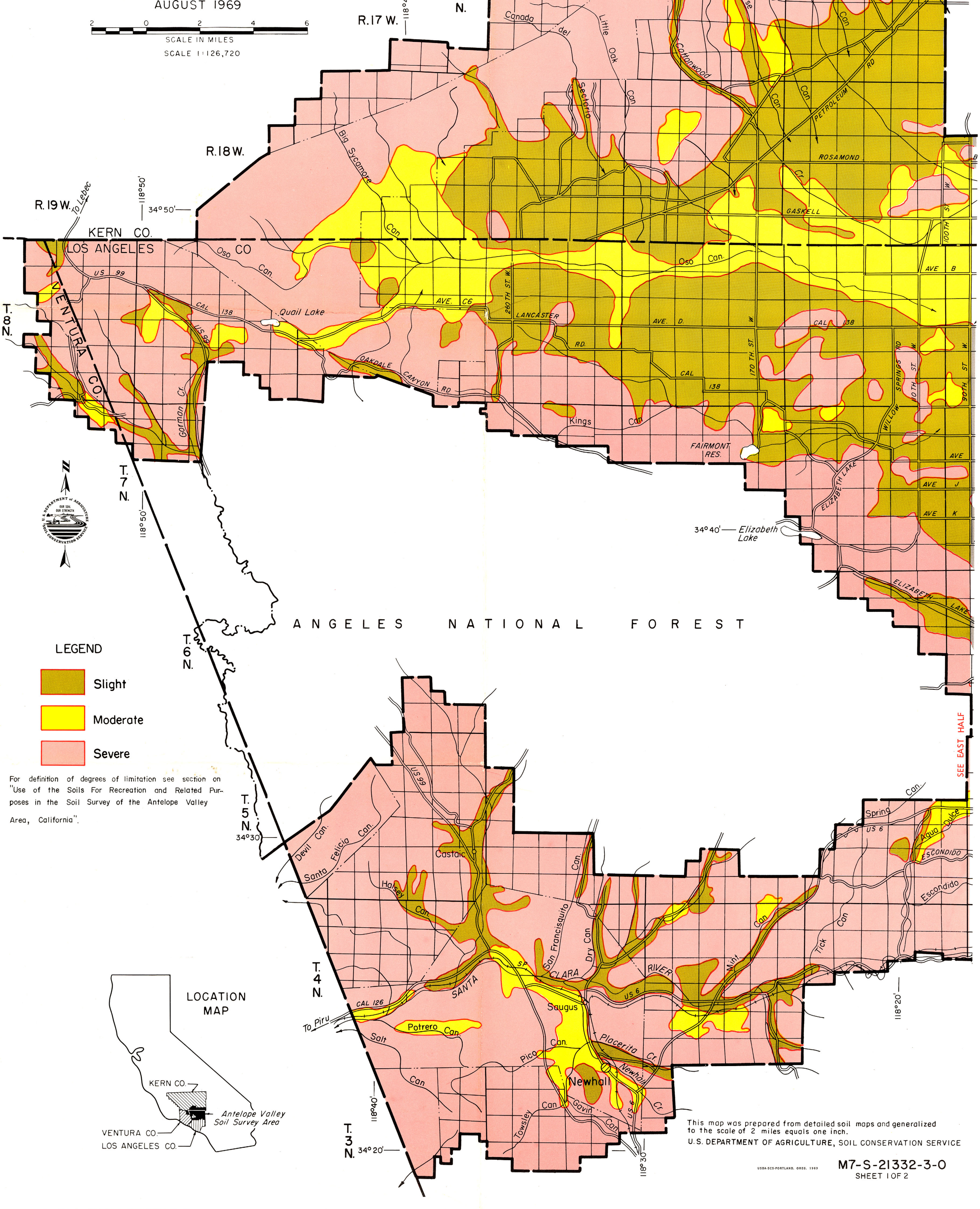
U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

USDA-SCS-PORTLAND, OREG. 1969

SOIL LIMITATIONS FOR SEPTIC TANK FILTER FIELDS
West Half

ANTELOPE VALLEY AREA
CALIFORNIA

AUGUST 1969



This map was prepared from detailed soil maps and generalized to the scale of 2 miles equals one inch.

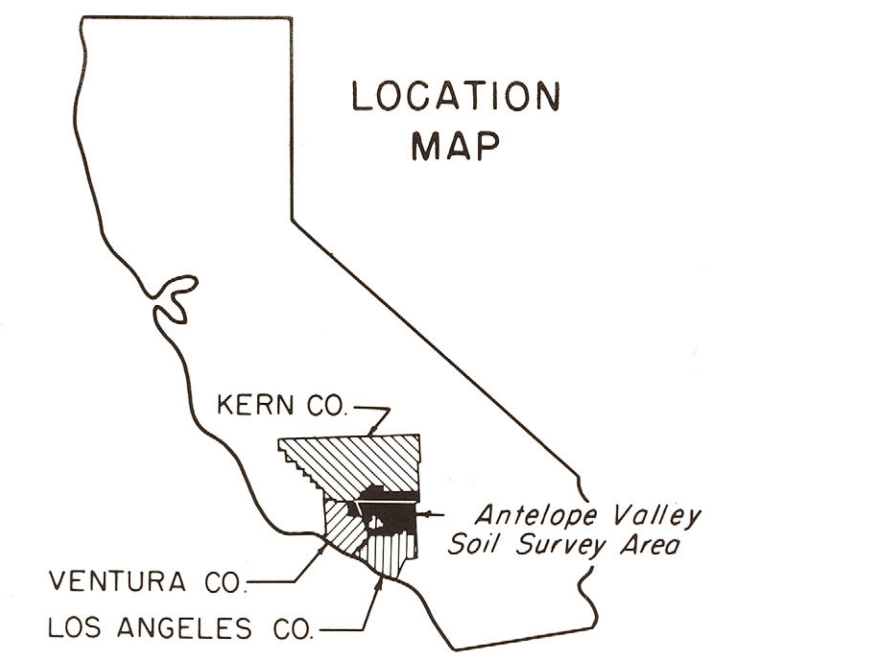
U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

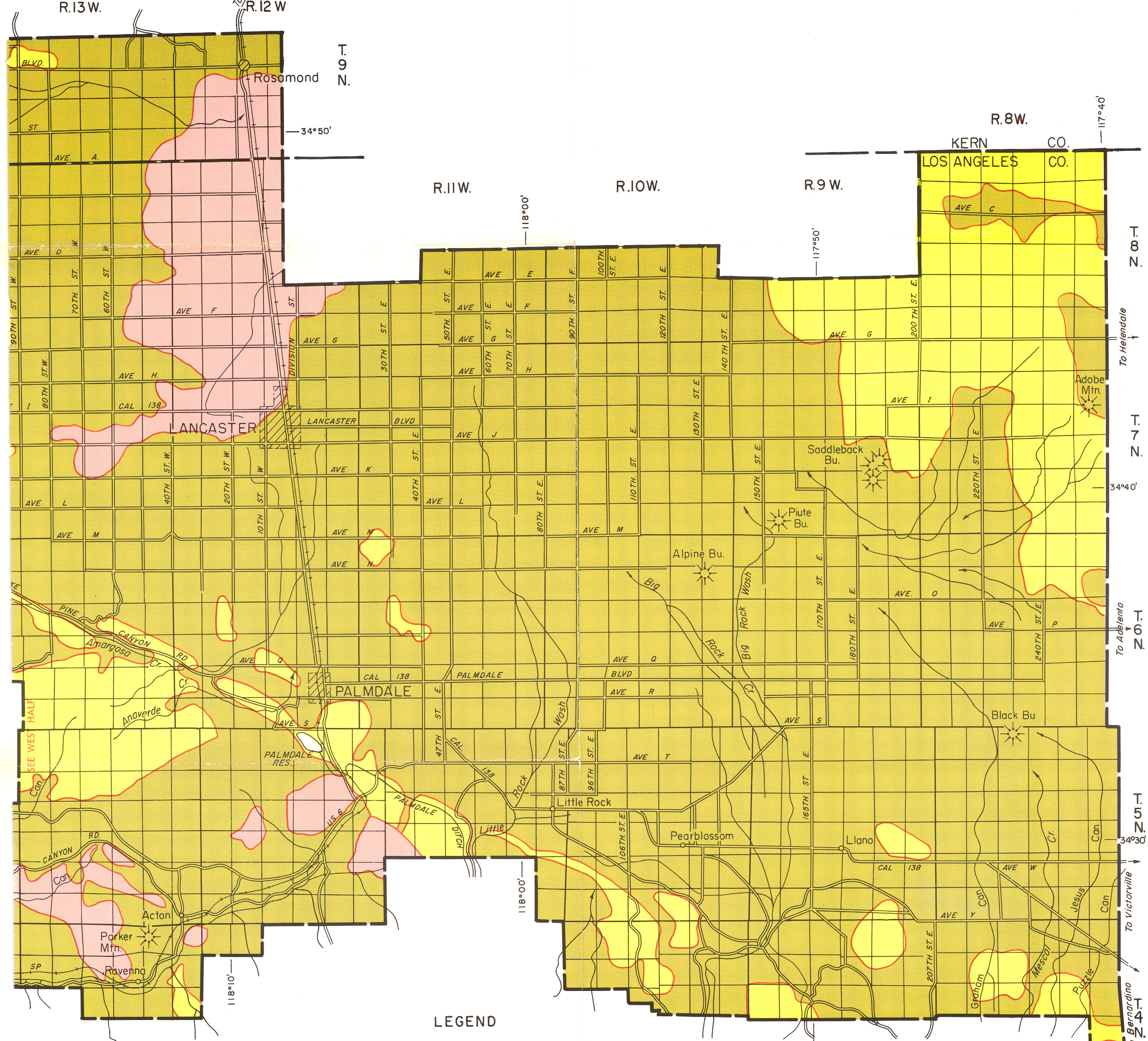
M7-S-21332-3-0
SHEET 1 OF 2

ESTIMATED SHRINK-SWELL POTENTIAL OF THE SOILS
East Half
ANTELOPE VALLEY AREA
CALIFORNIA

AUGUST 1969

2 0 2 4 6
SCALE IN MILES
SCALE 1:126,720





LEGEND

- Low
- Moderate
- High

See discussion of Engineering Properties in the section on Engineering Uses of the Soils in the Soil Survey of the Antelope Valley Area, California.

This map was prepared from detailed soil maps and generalized to the scale of 2 miles equals one inch.
U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

USDA-SCS-PORTLAND, OREG. 1969
M7-S-21332-2-0
SHEET 2 OF 2

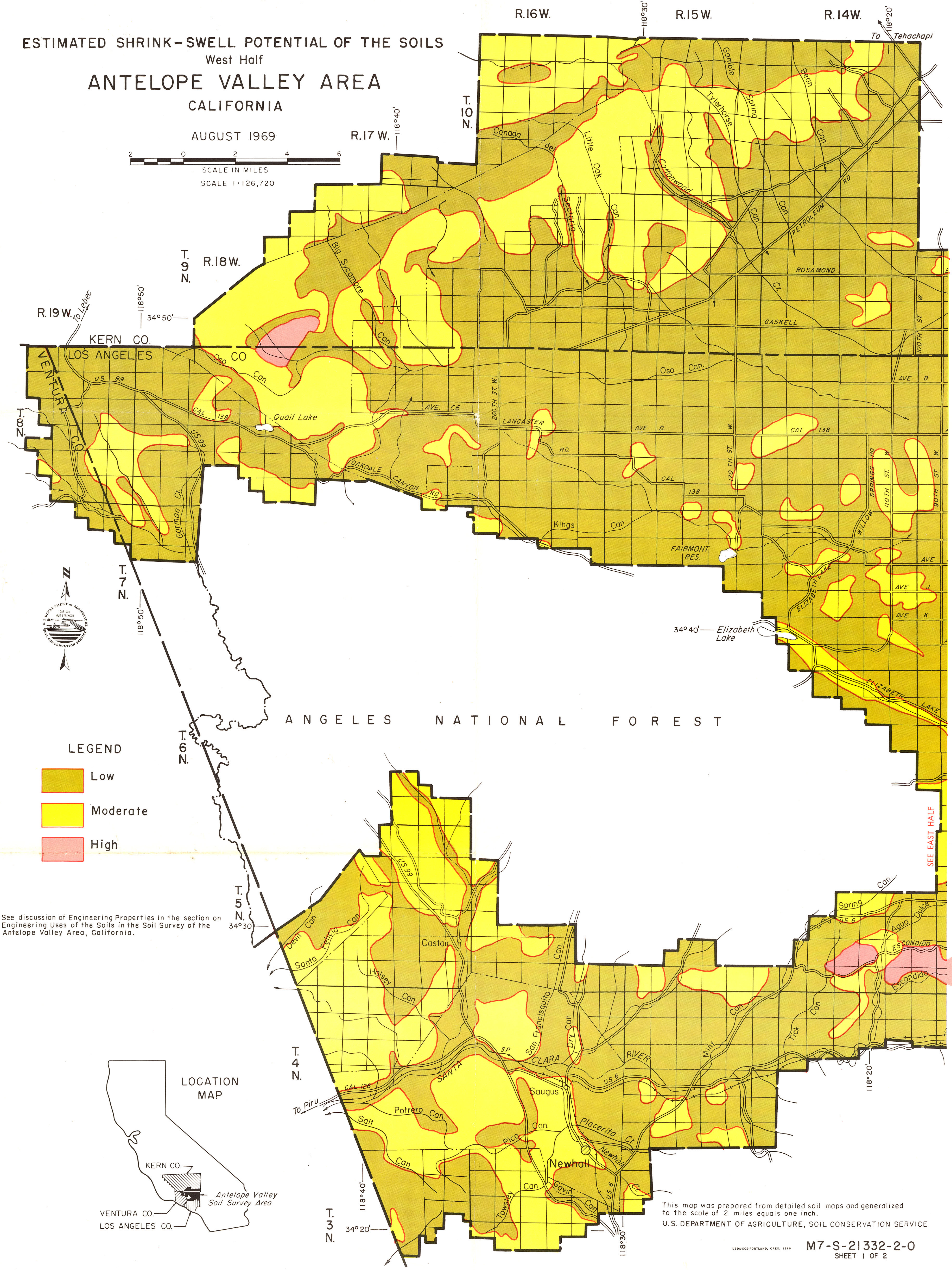
ESTIMATED SHRINK-SWELL POTENTIAL OF THE SOILS

West Half

ANTELOPE VALLEY AREA

CALIFORNIA

AUGUST 1969



LEGEND

- Low
- Moderate
- High

See discussion of Engineering Properties in the section on Engineering Uses of the Soils in the Soil Survey of the Antelope Valley Area, California.

LOCATION MAP

KERN CO.
Antelope Valley Soil Survey Area
VENTURA CO.
LOS ANGELES CO.

This map was prepared from detailed soil maps and generalized to the scale of 2 miles equals one inch.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

USDA-SCS-PORTLAND, OREG. 1969

M7-S-21332-2-0

SHEET 1 OF 2

SUMMARY OF SOIL CHARACTERISTICS AND QUALITIES
ANTELOPE VALLEY AREA, CALIFORNIA

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
LOS ANGELES COUNTY
ANTELOPE VALLEY SOIL CONSERVATION DISTRICT
and
UNIVERSITY OF CALIFORNIA
Agricultural Experiment Station

Map symbol	Soil name	Position	Soil profile 1/ Surface layer	Subsoil	Substratum or parent material	Natural drainage class	Subsoil permea- bility	Runoff	Erosion hazard Wind	Water	Effective rooting depth	Available water capacity	Inherent fertility	Present land use
											Inches	Inches		
AaB	Adelanto loamy sand, 2 to 5 percent slopes.	Gently sloping alluvial fans.	Pale brown, massive, slightly hard, pH 6.1 to 6.5, 14 to 18 inches thick. (A1)	Reddish-brown heavy sandy loam, blocky, hard, pH 7.9 to 8.4, slightly calcareous, 50 to 58 inches thick. (B21t)	Brown coarse sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous. (C)	Well drained--	Moderate--	Slow------	Moderate---	Slight------	60	6.0-8.0	Low--------	Range, wildlife.
AcA	Adelanto coarse sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Brown, massive, slightly hard, pH 6.1 to 6.5, 12 to 28 inches thick. (A1)	Reddish-brown heavy sandy loam, blocky, hard, pH 7.9 to 8.4, slightly calcareous, 50 to 58 inches thick. (B21t)	Brown coarse sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous. (C)	Well drained--	Moderate--	Very slow.	Moderate---	Slight-------	60	7.5-9.0	Low--------	Irrigated crops; range.
AdB	Adelanto gravelly sandy loam, 2 to 5 percent slopes.	Gently sloping terraces.	Pale brown, massive, slightly hard, pH 6.1 to 6.5, 10 to 14 inches thick. (A1)	Reddish-brown gravelly heavy sandy loam, blocky, hard, pH 7.9 to 8.4, slightly calcareous, 50 to 58 inches thick. (B21t)	Brown gravelly coarse sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous. (C)	Well drained--	Moderate--	Slow------	Slight-----	Slight------	60	5.0-6.5	Low--------	Range.
AgF	Agua Dulce stony loam, 30 to 50 percent slopes.	Steep mountainous uplands.	Grayish brown, massive, hard, pH 6.1 to 6.5, 6 to 12 inches thick. (A3)	Brown very cobbly and gravelly clay loam, blocky, hard, pH 6.1 to 6.5, 12 to 20 inches thick. (B2t)	Light yellowish-brown very gravelly loamy coarse sand, massive, weakly consolidated, pH 6.1 to 6.5. (C)	Well drained--	Moderately slow.	Rapid-----	None-------	High--------	36-60	3.0-4.0	Moderate---	Range, wildlife, watershed.
AmF2	Amargosa rocky coarse sandy loam, 9 to 55 percent slopes, eroded.	Strongly sloping to steep hilly uplands.	Yellowish brown, massive, slightly hard, pH 6.1 to 6.5, 10 to 14 inches thick. (A12)	Yellowish-brown gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 4 to 6 inches thick. (C)	Hard granitic rock. (R)	Excessively drained.	Moderately rapid.	Medium to rapid.	Slight-----	Moderate to high.	14-20	1.0-1.5	Very low---	Wildlife, watershed, recreation, range.
AnE	Anaverde loam, 15 to 30 percent slopes.	Moderately steep uplands.	Dark grayish-brown, crumb, soft, pH 6.1 to 6.5, 20 to 24 inches thick. (A11)	Grayish-brown light clay loam, blocky, slightly hard, pH 6.1 to 6.5, 16 to 32 inches thick. (C1)	Hard, olive-gray schist. (R)	Well drained--	Moderate--	Medium----	None-------	Moderate----	36-55	5.5-9.0	High-------	Range, wildlife, recreation.
ApF	Anaverde rocky loam, 30 to 50 percent slopes.	Steep uplands----	Dark grayish brown, crumb, soft, pH 6.1 to 6.5, 20 to 24 inches thick. (A11)	Grayish-brown light clay loam, blocky, slightly hard, pH 6.1 to 6.5, 16 to 32 inches thick. (C1)	Hard, olive-gray schist. (R)	Well drained--	Moderate--	Rapid-----	None-------	High--------	36-55	5.5-9.0	High-------	Range, wildlife, watershed.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
AsB	Arizo gravelly loamy sand, 0 to 5 percent slopes.	Nearly level to gently sloping alluvial fans.	Pale brown, massive, soft, pH 6.6 to 7.3, surface texture is variable, 3 to 6 inches thick. (C1)	Pale-brown very cobbly loamy sand, single grain, loose, pH 6.6 to 7.3, 28 to 32" inches thick. (C2)	Pale-brown very gravelly loamy sand, massive, slightly hard, pH 7.4 to 7.8, slightly calcareous. (C3)	Excessively drained.	Very rapid.	Very slow.	Moderate----	Slight to none.	60	2.0-3.0	Very low---	Range, gravel pits, wildlife.
AtA	Arizo loamy fine sand, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, massive, soft, pH 6.6 to 7.3, 20 to 24 inches thick. (C1)	Pale-brown very gravelly loamy sand, massive, slightly hard, pH 6.6 to 7.3, 16 to 20 inches thick. (C2)	Pale-brown very gravelly loamy sand, massive, slightly hard, pH 7.4 to 7.8, slightly calcareous. (C3)	Excessively drained.	Very rapid.	Very slow.	High--------	Slight to none.	60	3.0-4.0	Low--------	Range.
AyD	Ayar clay loam, 5 to 15 percent slopes.	Moderately sloping to strongly sloping uplands.	Pale brown, blocky, hard, pH 7.9 to 8.4, violently calcareous, 12 to 14 inches thick. (A1)	Grayish-brown silty clay, blocky, very hard, pH 8.5 to 9.0, strongly calcareous, 26 to 28 inches thick. (C1)	White clay loam, massive, hard, pH 8.5 to 9.0, violently calcareous. (C2)	Well drained--	Slow------	Slow to medium.	None--------	Slight to moderate.	60	8-10	Low--------	Range.
CaA	Cajon loamy sand, 0 to 2 percent slopes.	Nearly level alluvial fans.	Very pale brown, massive, slightly hard, pH 6.6 to 7.3, 8 to 12 inches thick. (A1)	Very pale brown fine sand, platy, soft, pH 7.4 to 7.8, 15 to 20 inches thick. (C1)	Very pale brown sand, platy, soft, pH 7.9 8.4, slightly calcareous. (C2)	Excessively drained.	Rapid-----	Very slow.	Moderate----	Slight to none.	60	4.0-5.0	Low--------	Irrigated crops, range.
CaC	Cajon loamy sand, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Very pale brown, massive, soft pH 6.6 to 7.3, 8 to 12 inches thick. (A1)	Very pale brown fine sand, platy, soft, pH 7.4 to 7.8, 15 to 20 inches thick. (C1)	Very pale brown sand, platy, soft, pH 7.9 to 8.4, slightly calcareous. (C2)	Excessively drained.	Rapid-----	Slow------	Moderate----	Slight-------	60	4.0-5.0	Low--------	Irrigated crops, range.
CbA	Cajon loamy sand, loamy substratum, 0 to 2 percent slopes.	Nearly level alluvial fans.	Very pale brown, massive, soft, pH 6.6 to 7.3, 8 to 12 inches thick. (A1)	Very pale brown fine sand, platy, soft, pH 7.4 to 7.8, 22 to 28 inches thick. (C1)	Light-gray loam, massive, hard, violently calcareous. (C2)	Excessively drained.	Moderate--	Very slow.	Moderate----	Slight to none.	60	5.0-7.0	Low-------	Irrigated crops, range.
CcA2	Cajon loamy fine sand, 0 to 2 percent slopes, hummocky.	Nearly level alluvial fans.	Very pale brown, massive, slightly hard, pH 6.5 to 7.3, 24 to 36 inches thick. (A1)	Very pale brown fine sand, platy, soft, pH 7.4 to 7.8, 4 to 16 inches thick. (C1)	Very pale brown sand, platy, soft, pH 7.9 to 8.4, slightly calcareous. (C2)	Excessively drained.	Rapid-----	Very slow.	High--------	Slight to none.	60	3.0-5.0	Low--------	Range, irrigated crops.
CcD2	Cajon loamy fine sand, 9 to 15 percent slopes, hummocky.	Strongly sloping alluvial fans.	Light yellowish brown, blocky, soft, pH 6.6 to 7.3, 24 to 36 inches thick. (A1)	Light yellowish-brown loamy fine sand, massive, soft, pH 6.6 to 7.3, 24 to 30 inches thick. (C1)	Hard, slightly weathered granitic rock. (R)	Excessively drained.	Rapid-----	Slow------	High--------	Slight-------	48-60	3.5-5.0	Low--------	Range, wildlife, recreation.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1]			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
ChC	Calvista-Hi Vista complex, 2 to 9 percent slopes:													
	Calvista sandy loam part.	Gently sloping to moderately sloping uplands	Pale brown, blocky, slightly hard, pH 7.9 to 8.4, 7 to 10 inches thick. (A11)	Light yellowish-brown heavy sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 8 to 10 inches thick. (C1)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Slow-----	Moderate---	Slight------	15-18	1.5-2.0	Very low---	Limited range, recreation, homesites.
	Hi Vista loamy fine sand part.	Gently sloping to moderately sloping uplands.	Light yellowish brown, massive, slightly hard, pH 6.6 to 7.3, 6 to 9 inches thick. (A1)	Reddish-brown sandy clay loam, blocky, hard, pH 7.4 to 7.8, slightly calcareous, 19 to 27 inches thick. (B22t)	Hard granitic rock. (R)	Well drained--	Moderately slow.	Slow-----	Moderate---	Slight------	25-36	4.0-6.0	Low--------	Limited range, recreation, homesites.
ChE	Calvista-Hi Vista rocky complex, 9 to 30 percent slopes:													
	Calvista sandy loam part.	Strongly sloping to moderately steep uplands.	Pale brown, blocky, slightly hard, pH 7.9 to 8.4, 7 to 10 inches thick. (A11)	Light yellowish-brown heavy sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 8 to 10 inches thick. (C1)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Medium---	Moderate---	Moderate----	15-18	1.5-2.0	Very low---	Range recreation.
	Hi Vista loamy fine sand part.	Strongly sloping to moderately steep uplands.	Light yellowish brown massive, slightly hard, pH 6.6 to 7.3, 6 to 10 inches thick. (A1)	Reddish-brown sandy clay loam, blocky, hard, pH 7.4 to 7.8, slightly calcareous, 19 to 27 inches thick. (B22t)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Medium---	Moderate---	Moderate----	25-36	4.0-6.0	Low--------	Range, recreation.
CkC	Castaic silty clay loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping toe slopes.	Pinkish gray, blocky, hard, pH 7.9 to 8.4, 6 to 8 inches thick. (A1)	Brown silty clay loam, blocky, hard, pH 7.9 to 8.4, slightly calcareous, 24 to 36 inches thick. (C1)	Pinkish-gray, soft nonmarine, weathered shale. (C2)	Well drained--	Moderately slow.	Slow to medium.	None-------	Slight to moderate.	30-44	5.0-7.5	Low--------	Range, homesites.
CkD	Castaic silty clay loam, 9 to 15 percent slopes.	Strongly sloping toe slopes.	Pinkish gray, blocky, hard, pH 7.9 to 8.4, 6 to 8 inches thick. (A1)	Brown silty clay loam, blocky, hard, pH 7.9 to 8.4, slightly calcareous, 24 to 36 inches thick. (C1)	Pinkish-gray, soft nonmarine, weathered shale.	Well drained--	Moderately slow.	Medium---	None-------	Moderate----	30-44	5.0-7.5	Low--------	Range, homesites.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1/]			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
CmD	Castaic-Balcom silty clay loams, 9 to 15 percent slopes:													
	Castaic silty clay loam part.	Strongly sloping toe slopes.	Pale brown, blocky, hard, pH 6.6 to 7.3, 8 to 12 inches thick. (A1)	Yellowish-brown silty clay loam, blocky, hard, pH 6.6 to 7.3, 17 to 28 inches thick. (C1)	Yellowish-brown weathered shale. (C2)	Well drained--	Moderately slow.	Medium---	None-----	Moderate-----	26-40	5.0-7.0	Moderate---	Dryland small grains, pasture, range.
	Balcom silty clay loam part.	Strongly sloping toe slopes.	Pale brown, blocky, hard, pH 7.4 to 7.8, 6 to 10 inches thick. (A1)	Pale-brown silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 20 to 30 inches thick. (C1)	Light olive-brown soft shale. (C2)	Well drained--	Moderately slow.	Medium---	None-----	Moderate-----	26-40	5.0-7.0	Moderate---	Dryland small grains, pasture, range.
CmE	Castaic-Balcom silty clay loams, 15 to 30 percent slopes:													
	Castaic silty clay loam part.	Moderately steep uplands.	Pale brown, blocky, hard, pH 6.6 to 7.3, 8 to 16 inches thick. (A1)	Yellowish-brown silty clay loam, blocky, hard, pH 6.6 to 7.3, 18 to 28 inches thick. (C1)	Yellowish-brown weathered shale. (C2)	Well drained--	Moderately slow.	Medium to rapid.	None-----	Moderate to high.	26-40	5.0-7.0	Moderate---	Range, wildlife.
	Balcom silty clay loam part.	Moderately steep uplands.	Pale-brown, blocky, hard, pH 7.4 to 7.8, 6 to 10 inches thick. (A1)	Pale-brown silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 20 to 30 inches thick. (C1)	Light olive-brown soft shale. (C2)	Well drained--	Moderately slow.	Medium to rapid.	None-----	Moderate to high.	26-40	5.0-7.0	Moderate---	Range, wildlife.
CmF	Castaic-Balcom silty clay loams, 30 to 50 percent slopes:													
	Castaic silty clay loam part.	Steep uplands---	Pale brown, blocky, hard, pH 6.6 to 7.3, 10 to 12 inches thick. (A1)	Yellowish-brown silty clay loam, blocky, hard, pH 6.6 to 7.3, 16 to 28 inches thick. (C1)	Yellowish-brown weathered shale. (C2)	Well drained--	Moderately slow.	Rapid----	None-----	High---------	26-40	5.0-7.0	Moderate---	Range, wildlife, watershed.
	Balcom silty clay loam part.	Steep uplands---	Pale brown, blocky, hard, pH 7.4 to 7.8, 10 to 12 inches thick. (A1)	Pale-brown silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 20 to 30 inches thick. (C1)	Light olive-brown soft shale. (C2)	Well drained--	Moderately slow.	Rapid----	None-----	High---------	26-40	5.0-7.0	Moderate---	Range, wildlife, watershed.

See footnotes at end of table.

SUMMARY OF SOIL CHARACTERISTICS AND QUALITIES, ANTELOPE VALLEY AREA, CALIFORNIA--Continued

Map symbol	Soil name	Position	Soil profile 1/ Surface layer	Subsoil	Substratum or parent material	Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard Wind	Water	Effective rooting depth	Available water capacity	Inherent fertility	Present land use
											Inches	Inches		
CmF2	Castaic-Balcom silty clay loams, 30 to 50 percent slopes, eroded:													
	Castaic silty clay loam part.	Steep uplands--	Pale brown, blocky, hard, pH 6.6 to 7.3, 8 to 12 inches thick. (A1)	Yellowish-brown silty clay loam, blocky, hard, pH 6.6 to 7.3, 18 to 28 inches thick. (C1)	Yellowish-brown weathered shale. (C2)	Well drained--	Moderately slow.	Rapid-----	None------	High-------	26-40	5.0-7.0	Moderate---	Range, wildlife, water-shed, recrea-tion.
	Balcom silty clay loam part.	Steep uplands--	Pale brown, blocky, hard, pH 7.4 to 7.8, 8 to 16 inches thick. (A1)	Pale-brown silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 14 to 24 inches thick. (C1)	Light olive-brown soft shale. (C2)	Well drained--	Moderately slow.	Rapid-----	None------	High-------	26-40	5.0-7.0	Moderate---	Range, wildlife, water-shed, re-creation.
CmG2	Castaic-Balcom silty clay loams, 50 to 65 percent slopes, eroded:													
	Castaic silty clay loam part.	Very steep mountainous uplands.	Pale brown, blocky, hard, pH 6.6 to 7.3, 8 to 12 inches thick. (A1)	Yellowish-brown silty clay loam, blocky, hard, pH 6.6 to 7.3, 18 to 28 inches thick. (C1)	Yellowish-brown weathered shale. (C2)	Well drained--	Moderately slow.	Very rapid.	None------	Very high.	26-40	5.0-7.0	Moderate---	Wildlife, water-shed, range.
	Balcom silty clay loam part.	Very steep mountainous uplands.	Pale brown, blocky, hard, pH 7.4 to 7.8, 8 to 16 inches thick. (A1)	Pale-brown silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 14 to 24 inches thick. (C1)	Light olive-brown soft shale. (C2)	Well drained--	Moderately slow.	Very rapid.	None------	Very high.	26-40	5.0-7.0	Moderate---	Wildlife, water-shed, range.
CnG3	Castaic and Saugus soils, 30 to 65 percent slopes, severely eroded:													
	Castaic silty clay loam part.	Very steep dissected mountainous uplands.	Pale brown, hard, pH 6.6 to 7.3, 8 to 12 inches thick. (A1)	Yellowish-brown silty clay loam, blocky, hard, pH 6.6 to 7.3, 12 to 20 inches thick. (C1)	Weathered shale. (C2)	Well drained--	Moderately slow	Very rapid.	None------	Very high.	20-30	4.0-6.0	Very low---	Wildlife, water-shed.
	Saugus loam part.	Very steep dissected mountainous uplands.	Grayish brown, blocky, hard, pH 6.6 to 7.3, 4 to 6 inches thick. (A1)	Grayish-brown loam, blocky, hard, pH 6.1 to 6.5, 20 to 38 inches thick. (C2)	Weakly consolidated sediment. (C3)	Well drained--	Moderate--	Very rapid.	None------	Very high.	24-44	4.0-7.0	Very low---	Wildlife, water-shed.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1/] Surface layer	Soil profile Subsoil	Soil profile Substratum or parent material	Natural drainage class	Subsoil permeability	Runoff	Erosion hazard Wind	Erosion hazard Water	Effective rooting depth	Available water capacity	Inherent fertility	Present land use
											Inches	Inches		
Co	Chino loam----------	Nearly level valleys.	Gray, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 16 to 20 inches thick. (A1)	Gray silty clay loam, blocky, hard, pH 8.5 to 9.0, strongly calcareous, 10 to 14 inches thick. (C1)	Light brownish-gray mottled clay loam, massive, hard, pH 9.0+, violently calcareous. (C2)	Somewhat poorly drained.	Moderately slow.	Very slow to ponded in places.	None-------	None to slight.	60	10.0-12.0	Moderate, but high when reclaimed	Wet meadow pasture.
CyA	Cortina sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, massive, slightly hard, pH 6.6 to 7.3, 12 to 22 inches thick. (A1)	Pale-brown very gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 24 to 28 inches thick. (C1)	Light yellowish-brown very cobbly sandy loam, massive, pH 6.6 to 7.3. (C2)	Excessively drained.	Rapid-----	Very slow--	Slight-----	Slight--------	60	2.5-4.0	Low-------	Range, irrigated crops, dryland small grains, pasture.
CyC	Cortina sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Pale brown, massive, slightly hard, pH 6.1 to 6.5, 12 to 16 inches thick. (A1)	Pale-brown very gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 24 to 28 inches thick. (C1)	Light yellowish-brown very cobbly sandy loam, massive, pH 6.6 to 7.3. (C2)	Excessively drained.	Rapid-----	Slow-------	Slight-----	Slight--------	60	2.5-4.0	Low-------	Range, irrigated crops, dryland small grains, pasture.
CzC	Cortina cobbly sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Pale brown, massive, slightly hard, pH 6.1 to 6.5, 5 to 22 inches thick. (A1)	Pale-brown very gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 14 to 18 inches thick. (C1)	Light yellowish brown-very cobbly sandy loam, massive, pH 6.6 to 7.3. (C2)	Excessively drained.	Rapid-----	Slow-------	Slight-----	Slight--------	60	2.0-3.0	Low-------	Range, wildlife, watershed.
DuD	Dune land-----------	Valley floor----	Very pale brown, single grain, loose, pH 6.6 7.3, 3 to 5 inches thick.	Pale-brown sand, single grain, loose, pH 6.6 to 7.8, slightly calcareous, 35 to 37 inches thick.	Pale-brown sand, single grain, loose, pH 6.6 to 7.8, slightly calcareous.	Excessively drained.	Very rapid.	Very slow.	Very high.	None----------	60	3.5-4.0	Very low--	Wildlife, recreation.
GaE2	Gaviota rocky sandy loam, 15 to 30 percent slopes, eroded.	Moderately steep uplands.	Light brownish gray, massive, slightly hard, PH 6.1 to 6.5, 10 to 12 inches thick. (A1)	Light brownish-gray sandy loam, massive, slightly hard, pH 6.1 to 6.5, 4 to 8 inches thick. (C1)	Hard, coarse-grained sandstone. (R)	Well drained--	Moderately rapid.	Medium-----	Slight-----	Moderate------	14-20	1.0-2.0	Low-------	Range, wildlife, watershed.
GaF2	Gaviota rocky sandy loam, 30 to 50 percent slopes, eroded.	Steep mountainous uplands.	Light brownish gray, massive, slightly hard, pH 6.1 to 6.5, 10 to 12 inches thick. (A1)	Light brownish-gray sandy loam, massive, slightly hard, pH 6.1 to 6.5, 4 to 8 inches thick. (C1)	Hard, coarse-grained sandstone. (R)	Somewhat excessively drained.	Moderately rapid.	Rapid------	Slight-----	High----------	14-20	1.0-2.0	Low-------	Range, wildlife, watershed.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/ Surface layer	Subsoil	Substratum or parent material	Natural drainage class	Subsoil permea- bility	Runoff	Erosion hazard Wind	Water	Effective rooting depth	Available water capacity	Inherent fertility	Present land use
											Inches	Inches		
GbF	Gazos clay loam, 30 to 50 percent slopes.	Steep moun- tainous uplands.	Dark grayish brown, blocky, hard, pH 6.1 to 6.5, 20 to 26 in- ches thick. (A11)	Light brownish-gray clay loam, blocky, hard, pH 6.1 to 6.5, 0 to 14 in- ches thick. 2/	Hard shale. (R)-------	Well drained--	Moderately slow.	Rapid-----	None------	High--------	20-40	3.0-6.0	Moderate---	Range.
GcE	Godde loam, 15 to 30 percent slopes.	Moderately steep uplands.	Grayish brown, blocky, slightly hard, pH 6.1 to 6.5, 14 to 20 in- ches thick. (A1)	Generally not present.	Hard, dark-colored schist. (R)	Well drained--	Moderate--	Medium-----	None------	Moderate---	14-20	2.0-3.0	Low--------	Range, wildlife.
GdF	Godde rocky loam, 30 to 50 per- cent slopes.	Steep moun- tainous uplands.	Grayish brown, blocky, slightly hard, pH 6.1 to 6.5, 14 to 20 in- ches thick. (A1)	Generally not present.	Hard, dark-colored schist. (R)	Well drained--	Moderate--	Rapid------	None-------	High-------	14-20	2.0-3.0	Low--------	Range, wildlife, water- shed, re- creation.
GoD	Gorman sandy loam, 9 to 15 percent slopes.	Strongly sloping upland foot- hills.	Dark gray, blocky, hard, pH 6.1 to 7.3, 28 to 50 in- ches thick. (A12)	Brown light sandy clay loam, massive, hard, pH 5.6 to 6.0, 25 to 45 inches thick. (B21t)	Pink light sandy clay loam, massive, slightly hard, pH 5.1 to 5.5. (C)	Well drained--	Moderately slow.	Medium-----	Slight----	Moderate---	60	7.5-9.0	High-------	Small grains, range.
GoD2	Gorman sandy loam, 9 to 15 percent slopes, eroded.	Strongly sloping uplands.	Dark gray, blocky, hard, pH 6.1 to 7.3, 28 to 50 in- ches thick. (A12)	Brown light sandy clay loam, massive, hard, pH 5.6 to 6.0, 25 to 45 inches thick. (B21t)	Pink light sandy clay loam, massive, slightly hard, pH 5.1 to 5.5. (C)	Well drained--	Moderately slow.	Medium-----	Slight----	Moderate---	60	7.5-9.0	High-------	Small grains, range.
GoE2	Gorman sandy loam, 15 to 30 percent slopes, eroded.	Moderately steep uplands.	Dark gray, blocky, hard, pH 6.1 to 7.3, 28 to 50 in- ches thick. (A12)	Brown light sandy clay loam, massive, hard, pH 5.6 to 6.0, 25 to 45 inches thick. (B21t)	Pink light sandy clay loam, massive, slightly hard, pH 5.1 to 5.5. (C)	Well drained--	Moderately slow.	Medium to rapid.	Slight----	Moderate to high.	60	7.5-9.0	High-------	Range, wildlife, water- shed.
GoF2	Gorman sandy loam, 30 to 50 percent slopes, eroded.	Steep moun- tainous uplands.	Dark gray, blocky, hard, pH 6.1 to 7.3, 24 to 28 in- ches thick. (A12)	Brown light sandy clay loam, massive, hard, pH 5.6 to 6.0, 25 to 45 inches thick. (B21t)	Pink light sandy clay loam, massive, slightly hard, pH 5.1 to 5.5. (C)	Well drained--	Moderately slow.	Rapid------	Slight----	Very high.	60	7.5-9.0	High-------	Wildlife, range, water- shed.
GsA	Greenfield sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Brown, massive, hard, pH 6.1 to 6.5, 16 to 24 inches thick. (A1)	Brown heavy sandy loam, massive, hard, pH 6.6 to 7.3, 36 to 44 inches thick. (B2t)	Brown coarse sandy loam, massive, hard, pH 6.6 to 7.3. (C)	Well drained--	Moderately rapid.	Very slow.	Slight----	Slight-----	60	7.5-9.0	Moderate---	Small grains, irrigated crops, pasture, range.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1/] Surface layer	Subsoil	Substratum or parent material	Natural drainage class	Subsoil permeability	Runoff	Erosion hazard Wind	Water	Effective rooting depth	Available water capacity	Inherent fertility	Present land use
											Inches	Inches		
GsC	Greenfield sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Brown, massive, hard, pH 6.1 to 6.5, 16 to 24 inches thick. (A1)	Brown heavy sandy loam, massive, hard, pH 6.6 to 7.3, 36 to 44 inches thick. (B2t)	Brown coarse sandy loam, massive, hard, pH 6.6 to 7.3. (C)	Well drained--	Moderately rapid.	Slow to medium.	Slight-----	Slight to moderate.	60	7.5-9.0	Moderate---	Small grains, irrigated crops, pasture, range.
GsC2	Greenfield sandy loam, 2 to 9 percent slopes, eroded.	Gently sloping to moderately sloping alluvial fans.	Brown, massive, hard, pH 6.1 to 6.5, 16 to 24 inches thick. (A1)	Brown heavy sandy loam, massive, hard, pH 6.6 to 7.3, 36 to 44 inches thick. (B2t)	Brown coarse sandy loam, massive, hard, pH 6.6 to 7.3. (C)	Well drained--	Moderately rapid.	Slow to medium.	Slight ----	Slight to moderate.	60	7.5-9.0	Moderate---	Small grains, irrigated crops, pasture, range.
GsD2	Greenfield sandy loam, 9 to 15 percent slopes, eroded.	Strongly sloping alluvial fans and terraces.	Brown, massive, hard, pH 6.1 to 6.5, 16 to 18 inches thick. (A1)	Brown heavy sandy loam, massive, hard, pH 6.6 to 7.3, 36 to 44 inches thick. (B2t)	Brown coarse sandy loam, massive, hard, pH 6.6 to 7.3. (C)	Well drained--	Moderately rapid.	Medium to rapid.	Slight-----	Moderate to high.	60	7.5-9.0	Moderate---	Small grains, pasture, range.
GuF	Gullied land--------	Steep dissected uplands.	Variable---------	Variable----------	Variable--------------	Variable------	Variable--	Very rapid.	Slight-----	Very high.	Variable.	Variable.	Very low---	Watershed.
HaB2	Hanford loamy sand, 2 to 5 percent slopes, hummocky.	Gently sloping alluvial fans.	Pale brown, massive, hard, pH 6.1 to 6.5, 24 to 36 inches thick. (A1)	Light yellowish-brown coarse sandy loam, massive, slightly hard, pH 6.1 to 6.5, 36 to 40 inches thick. (C1)	Light yellowish-brown gravelly loamy coarse sand, massive, slightly hard, pH 6.6 to 7.3. (C2)	Well drained--	Moderately rapid.	Very slow.	High-------	Slight-------	60	4.5-5.5	Low--------	Range.
HbA	Hanford coarse sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Light yellowish-brown coarse sandy loam, massive, slightly hard, pH 6.1 to 6.5, 30 to 34 inches thick. (C1)	Light yellowish-brown gravelly loamy coarse sand, massive, slightly hard, pH 6.6 to 7.3. (C2)	Well drained--	Moderately rapid.	Slow----	Slight to moderate.	Slight-------	60	5.0-7.0	Low--------	Small grains, irrigated crops, range.
HbC	Hanford coarse sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Pale brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Light yellowish-brown coarse sandy loam, massive, slightly hard, pH 6.1 to 6.5, 30 to 34 inches thick. (C1)	Light yellowish-brown gravelly loamy coarse sand, massive, slightly hard, pH 6.6 to 7.3. (C2)	Well drained--	Moderately rapid.	Slow to medium.	Slight to moderate.	Slight to moderate.	60	5.0-7.0	Low--------	Small grains, irrigated crops, range.
HbD	Hanford coarse sandy loam, 9 to 15 percent slopes.	Strongly sloping alluvial fans.	Pale brown, massive, hard, pH 6.1 to 6.5, 8 to 12 inches thick. (A1)	Light yellowish-brown coarse sandy loam, massive, slightly hard, pH 6.1 to 6.5, 30 to 34 inches thick. (C1)	Light yellowish-brown gravelly loamy coarse sand, massive, slightly hard, pH 6.6 to 7.3. (C2)	Well drained--	Moderately rapid.	Medium--	Slight to moderate.	Moderate-----	60	5.0-7.0	Low--------	Small grains, pasture, range.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1/]			Natural drainage class	Subsoil permea- bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
HcA	Hanford sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Light yellowish-brown fine sandy loam, massive, hard, pH 6.1 to 6.5, 30 to 34 inches thick. (C1)	Light yellowish-brown sandy loam, massive, slightly hard, pH 6.6 to 7.3. (C2)	Well drained--	Moderately rapid.	Slow------	Slight-----	Slight-------	60	6.0-7.5	Moderate---	Small grains, irrigated crops, range.
HcC	Hanford sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Pale brown, massive, hard, pH 6.1 to 6.5, 12 to 14 inches thick. (A1)	Light yellowish-brown fine sandy loam, massive, hard, pH 6.1 to 6.5, 30 to 34 inches thick. (C1)	Light yellowish-brown sandy loam, massive, slightly hard, pH 6.6 to 7.3. (C2)	Well drained--	Moderately rapid.	Slow to medium.	Slight-----	Slight to moderate.	60	6.0-7.5	Moderate---	Small grains, irrigated crops, range.
HdC	Hanford gravelly sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Pale brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Light yellowish-brown gravelly coarse sandy loam, massive, slightly hard, pH 6.1 to 6.5, 26 to 32 inches thick. (C1)	Light yellowish-brown gravelly loamy coarse sand, massive, slightly hard, pH 6.6 to 7.3. (C2)	Somewhat excessively drained.	Moderately rapid.	Slow to medium.	Slight-----	Slight to moderate.	60	5.0-7.0	Low--------	Range, wildlife.
HfA	Hanford loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Grayish brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Brown loam, massive, hard, pH 6.6 to 7.3, 26 to 32 inches thick. (C1)	Brown heavy loam, blocky, slightly hard, pH 6.6 to 7.3. (C2)	Well drained--	Moderate--	Very slow.	None-------	Slight-------	60	8.0-10.0	Moderate---	Small grains, irrigated crops, range.
HeC	Hanford sandy loam, calcareous variant, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Light brownish gray, massive, slightly hard, 7.4 to 7.8, slightly calcareous, 14 to 17 inches thick. (A1)	Pale-brown coarse sandy loam, massive, slightly hard, pH 7.4 to 7.8, strongly calcareous, 18 to 22 inches thick. (C1)	Light brownish-gray loam, massive, hard, pH 7.4 to 7.8, strongly calcareous. (C3)	Well drained--	Moderately rapid.	Slow------	Slight-----	Slight-------	60	7.5-9.0	Moderate---	Small grains, range.
HgA	Hesperia loamy fine sand, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, massive, slightly hard, pH 6.1 to 6.5, 8 to 10 inches thick. (A1)	Pale-brown fine sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 20 to 22 inches thick. (C1)	Pale-brown sandy loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous. (C2)	Well drained--	Moderately rapid.	Very slow.	Moderate---	Slight-------	60	6.5-7.5	Moderate---	Alfalfa, small grains, range.
HgA2	Hesperia loamy fine sand, 0 to 2 percent slopes, hummocky.	Nearly level alluvial fans.	Pale brown, massive, slightly hard, pH 6.1 to 6.5, 24 to 36 inches thick. (A1)	Pale-brown fine sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 4 to 16 inches thick. (C1)	Pale-brown sandy loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous. (C2)	Well drained--	Moderately rapid.	Very slow.	High-------	Slight-------	60	6.0-7.5	Low--------	Range.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
HgB	Hesperia loamy fine sand, 2 to 5 percent slopes.	Gently sloping alluvial fans.	Light brownish gray, massive, slightly hard, pH 6.1 to 6.5, 8 to 10 inches thick. (A1)	Pale-brown fine sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 30 to 32 inches thick. (C1)	Pale-brown sandy loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous. (C2)	Well drained--	Moderately rapid.	Very slow.	Moderate---	Slight-------	60	6.5-7.5	Moderate---	Alfalfa, small grains, range.
HkA	Hesperia fine sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, blocky, slightly hard, pH 6.1 to 6.5, 4 to 14 inches thick. (A1)	Pale-brown fine sandy loam, massive, slightly hard, pH 7.4 to 8.4, slightly calcareous, 46 to 54 inches thick. (C2)	Pale-brown sandy loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous. (C3)	Well drained--	Moderately rapid.	Very slow.	Slight to moderate.	Slight-------	60	7.5-8.5	Moderate---	Irrigated crops, range.
HkB	Hesperia fine sandy loam, 2 to 5 percent slopes.	Gently sloping alluvial fans.	Pale brown, blocky, slightly hard, pH 6.1 to 6.5, 4 to 14 inches thick. (A1)	Pale-brown fine sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 46 to 54 inches thick. (C2)	Pale-brown sandy loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous. (C3)	Well drained--	Moderately rapid.	Slow-----	Slight to moderate.	Slight to moderate.	60	7.5-8.5	Moderate---	Alfalfa, small grains, range.
HmA	Hesperia fine sandy loam, loamy substratum, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, blocky, slightly hard, pH 6.1 to 6.5, 4 to 14 inches thick. (A1)	Pale-brown fine sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 31 to 46 inches thick. (C1)	Pale-brown loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous. (C2)	Well drained--	Moderate--	Very slow.	Slight----	Slight-------	60	8.0-9.5	Moderate---	Alfalfa, small grains, range.
HnA	Hesperia loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Gray, platy, slightly hard, pH 7.9 to 8.4, very slightly calcareous, 5 to 14 inches thick. (A1)	Pale-brown fine sandy loam, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 26 to 35 inches thick. (C2)	Pale-brown sandy loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous. (C3)	Well drained--	Moderately rapid.	Very slow.	None-------	Slight-------	60	8.0-9.0	Moderate---	Alfalfa, small grains, range.
LaE	Las Posas loam, 9 to 30 percent slopes.	Strongly sloping and moderately steep toe slopes and foothills.	Dark brown, granular, soft, pH 6.6 to 7.3, 3 to 6 inches thick. (A1)	Reddish-brown heavy clay loam, blocky, very hard, pH 6.6 to 7.3, 21 to 26 inches thick. (B2t)	Hard, dark-colored basalt. (R)	Well drained--	Slow------	Medium to rapid.	None-------	Moderate to high.	24-32	4.0-7.0	Low--------	Range.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1]			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
LdF	Las Posas-Toomes rocky loams, 30 to 50 percent slopes:													
	Las Posas rocky loam, part.	Steep uplands-----	Dark brown, granular, soft, pH 6.6 to 7.3, 3 to 6 inches thick. (A1)	Reddish-brown heavy clay loam, blocky, very hard, pH 6.6 to 7.3, 21 to 26 inches thick. (B2t)	Hard, dark-colored basalt. (R)	Well drained--	Slow------	Rapid-----	None-------	High-------	24-32	4.0-7.0	Low--------	Range, wildlife.
	Toomes rocky loam part.	Steep uplands-----	Dark grayish brown, granular, soft, pH 6.6 to 7.3, 2 to 4 inches thick. (A1)	Yellowish-brown loam, massive, hard, pH 6.6 to 7.3, 10 to 14 inches thick. (B2)	Hard basalt. (R)------	Somewhat excessively drained.	Moderate--	Rapid-----	None-------	High-------	12-18	2.0-3.0	Low--------	Range, wildlife.
LeF	Lebec rocky loam, 15 to 50 percent slopes.	Moderately steep to steep mountainous uplands.	Brown, blocky, slightly hard, pH 7.9 to 8.4, violently calcareous, 18 to 28 inches thick. (A11)	Dark-brown gravelly heavy loam, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous, 16 to 20 inches thick. (C)	Hard limestone. (R)---	Well drained--	Moderate--	Medium to rapid.	None-------	Moderate to high.	34-48	4.0-7.0	Moderate---	Range, wildlife, watershed.
Me	Merrill sandy loam.	Nearly level basin rim.	Dark gray, massive, slightly hard, pH 7.9 to 8.4, violently calcareous, 8 to 19 inches thick. (A12)	Pale-brown clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 15 to 26 inches thick. (IIC1)	White loam, platy, very hard, pH 8.5 to 9.0, violently calcareous. (IIIC3ca)	Moderately well drained.	Moderately slow.	Very slow.	Moderate---	Slight-----	23-40	4.0-6.0	Low--------	Limited range, poultry farms.
MfA	Metz loamy sand, 0 to 2 percent slopes.	Nearly level alluvial fans.	Brown, blocky, soft, pH 6.6 to 7.3, 7 to 16 inches thick. (Ap)	Brown loamy sand, single grain, loose, pH 6.6 to 7.3, 30 to 34 inches thick. (C1)	Light brownish-gray sand, single grain, loose, pH 6.6 to 7.3. (C2)	Somewhat excessively drained.	Rapid-----	Very slow.	Slight-----	Slight-----	60	4.0-5.0	Low--------	Irrigated crops, small grains, wildlife.
MfC	Metz loamy sand, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Brown, blocky, soft, pH 6.6 to 7.3, 7 to 16 inches thick. (Ap)	Brown loamy sand, single grain, loose, pH 6.6 to 7.3, 30 to 34 inches thick. (C1)	Light brownish-gray sand, single grain, loose, pH 6.6 to 7.3. (C2)	Somewhat excessively drained.	Rapid-----	Slow------	Slight-----	Slight-----	60	4.0-5.0	Low--------	Irrigated crops, small grains, wildlife.
MgA	Metz loam, 0 to 2 percent slopes.	Nearly level flood plains.	Brown, massive, hard, pH 7.4 to 7.8, 8 to 16 inches thick. (Ap)	Brown loamy sand, single grain, loose, pH 6.6 to 7.3, 24 to 32 inches thick. (C1)	Light brownish-gray sand, single grain, loose, pH 6.6 to 7.3. (C2)	Somewhat excessively drained.	Rapid-----	Very slow.	None-------	Slight to none.	60	5.0-6.0	Moderate---	Alfalfa, row, crops.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1/] Surface layer	Subsoil	Substratum or parent material	Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard Wind	Water	Effective rooting depth	Available water capacity	Inherent fertility	Present land use
											Inches	Inches		
MgB	Metz loam, 2 to 5 percent slopes.	Gently sloping alluvial fans.	Brown, massive, hard, pH 7.4 to 7.8, 8 to 10 inches thick. (Ap)	Brown loamy sand, single grain, loose, pH 6.6 to 7.3, 30 to 32 inches thick. (C1)	Light brownish-gray sand, single grain, loose, pH 6.6 to 7.3. (C2)	Somewhat excessively drained.	Rapid-----	Slow------	None-------	Slight--------	60	5.0-6.0	Moderate---	Alfalfa, small grains.
MhE2	Millsholm rocky loam, 15 to 30 percent slopes, eroded.	Moderately steep upland foot-hills.	Pale brown, massive, slightly hard, pH 6.6 to 7.3, 4 to 8 inches thick. (A1)	Brown heavy loam, massive, hard, pH 6.6 to 7.3, 10 to 12 inches thick. (B2)	Hard shale and fine-grained sandstone. (R)	Well drained--	Moderate--	Medium to rapid.	None-------	Moderate to high.	14-20	2.0-3.0	Low--------	Range, wildlife, recrea-tion.
MhF2	Millsholm rocky loam, 30 to 50 percent slopes, eroded.	Steep uplands---	Pale brown, massive, slightly hard, pH 6.6 to 7.3, 4 to 8 inches thick. (A1)	Brown heavy loam, massive, hard, pH 6.6 to 7.3, 10 to 12 inches thick. (B2)	Hard shale and fine-grained sandstone. (R)	Well drained--	Moderate--	Rapid-----	None-------	High----------	14-20	2.0-3.0	Low--------	Range, wildlife, water-shed.
MoA	Mocho sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Brown, massive, slightly hard, pH 7.9 to 8.4, very slightly calcare-ous, 10 to 12 in-ches thick. (A1)	Grayish-brown loam, massive, hard, pH 7.9 to 8.4, violently calcare-ous, 28 to 30 in-ches thick. (C1)	Grayish-brown loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C3)	Moderately well drained.	Moderate--	Very slow.	Slight-----	Slight--------	60	7.5-9.5	High-------	Irrigated crops, dryland grains.
MpA	Mocho loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Grayish brown, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 10 to 18 inches thick. (A1)	Grayish-brown loam, massive, hard, pH 7.9 to 8.4, vio-lently calcareous, 18 to 21 inches thick. (C1)	Grayish-brown loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C3)	Moderately well drained.	Moderate--	Very slow.	None-------	None to slight.	60	8.0-10.0	High-------	Irrigated crops, dryland grains.
MpC	Mocho loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping allu-vial fans.	Grayish brown, massive, slightly hard, pH 7.9 to 8.4, slightly calcareous, 10 to 18 inches thick. (A1)	Grayish-brown loam, massive, hard, pH 7.9 to 8.4, violently cal-careous, 22 to 30 inches thick. (C1)	Grayish-brown loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C3)	Moderately well drained.	Moderate--	Slow to medium.	None-------	Slight to moderate.	60	8.0-10.0	High-------	Irrigated crops, dryland grains.
MzB	Mohave coarse sandy loam, 2 to 5 per-cent slopes.	Gently sloping terraces.	Brown, blocky, soft, pH 5.6 to 6.0, 5 to 12 inches thick. (A12)	Reddish-brown heavy sandy clay loam, prismatic, very hard, pH 6.1 to 6.5, 46 to 58 inches thick. (B21t)	Brown gravelly loamy coarse sand, single grain, loose, pH 6.6 to 7.3, slightly calcareous, (C)	Well drained--	Moderately slow.	Slow------	Slight to moderate.	Slight-------	60	7.5-9.0	Low--------	Range, wildlife, home-sites.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
OaC	Oakdale sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping terraces.	Grayish brown, massive, hard, pH 6.6 to 7.3, 22 to 28 inches thick. (A1)	Brown heavy sandy loam, massive, slightly hard, pH 6.6 to 7.3, 42 to 50 inches thick. (B2t)	Reddish-yellow gravelly coarse sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C)	Well drained--	Moderate--	Slow to medium.	Slight-----	Slight to moderate.	60	7.5-9.0	Moderate---	Small grains, range, wildlife.
ObA	Oak Glen sandy loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Grayish-brown, massive, slightly hard, pH 6.1 to 6.5, 24 to 34 inches thick. (A12)	Grayish-brown fine sandy loam, massive, slightly hard, pH 6.1 to 6.5, 28 to 32 inches thick. (C1)	Brown loamy coarse sand, blocky, soft, pH 5.6 to 6.0. (C2)	Well drained--	Moderately rapid.	Slow----	Slight-----	Slight------	60	6.0-7.5	High-------	Small grains, range.
ObC	Oak Glen sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping allu-vial fans.	Grayish brown, massive, slightly hard, pH 6.1 to 6.5, 24 to 34 inches thick. (A12)	Grayish-brown fine sandy loam, massive, slightly hard, pH 6.1 to 6.5, 28 to 32 inches thick. (C1)	Brown loamy coarse sand, blocky, soft, pH 5.6 to 6.0. (C2)	Well drained--	Moderately rapid.	Slow to medium.	Slight-----	Slight to moderate.	60	6.0-7.5	High-------	Small grains, range.
OcC	Oak Glen gravelly sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping allu-vial fans.	Grayish brown, massive, slightly hard, pH 6.1 to 6.5, 14 to 34 inches thick. (A1)	Grayish-brown gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 6 to 26 inches thick. (C1)	Grayish-brown gravelly very fine sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C2)	Well drained--	Moderately rapid.	Slow to medium.	Slight-----	Slight to moderate.	60	4.0-6.0	Moderate---	Range, wildlife.
OdA	Oak Glen loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Dark gray, massive, slightly hard, pH 6.1 to 6.5, 24 to 48 inches thick. (A1)	Pale-brown heavy sandy loam, massive, hard, pH 6.1 to 6.5, 0 to 16 inches thick. (C1)	Pale-brown light loam, massive, hard, pH 6.1 to 6.5. (C2)	Well drained--	Moderate--	Very slow.	None-------	None to slight.	60	8.0-10.0	High-------	Range, wildlife.
OdC	Oak Glen loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping allu-vial fans.	Dark-gray, massive, slightly hard, pH 6.1 to 6.5, 24 to 48 inches thick. (A1)	Pale-brown heavy sandy loam, massive, hard, pH 6.1 to 6.5, 0 to 16 inches thick. (C1)	Light-brown light loam, massive, hard, pH 6.1 to 6.5. (C2)	Well drained--	Moderate--	Slow to medium.	None-------	Slight to moderate.	60	8.0-10.0	High-------	Range, wildlife.
OgC	Ojai loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping terraces.	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 26 inches thick. (A11)	Reddish-brown clay loam, prismatic, very hard, pH 6.1 to 6.5, 24 to 36 inches thick. (B2t)	Reddish-yellow sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C)	Well drained--	Moderately slow.	Slow to medium.	None-------	Slight to moderate.	60	9.0-11.0	Low--------	Alfalfa, row crops, range, home-sites.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permeability	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum of parent material				Wind	Water				
											Inches	Inches		
OgD	Ojai loam, 9 to 15 percent slopes.	Strongly sloping terraces.	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 26 inches thick. (A11)	Reddish-brown clay loam, prismatic, very hard, pH 6.1 to 6.5, 16 to 26 inches thick. (B2t)	Reddish-yellow sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C)	Well drained--	Moderately slow.	Medium----	None-------	Moderate------	60	9.0-11.0	Low-------	Rnage, wildlife, dryland grains.
OgE	Ojai loam, 15 to 30 percent slopes.	Moderately steep terraces.	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 26 inches thick. (A11)	Reddish-brown clay loam, prismatic, very hard, pH 6.1 to 6.5, 12 to 20 inches thick. (B2t)	Reddish-yellow sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C)	Well drained--	Moderately slow.	Medium to rapid.	None-------	Moderate to high.	60	9.0-11.0	Low-------	Range, wildlife, watershed.
OgF	Ojai loam, 30 to 50 percent slopes.	Steep terraces----	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 26 inches thick. (A11)	Reddish-brown clay loam, prismatic, very hard, pH 6.1 to 6.5, 12 to 20 inches thick. (B2t)	Reddish-yellow sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C)	Well drained--	Moderately slow.	Rapid-----	None-------	High----------	60	9.0-11.0	Low-------	Range, wildlife, watershed.
OgF2	Ojai loam, 30 to 50 percent slopes, eroded.	Steep terraces----	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 18 inches thick. (A11)	Reddish-brown clay loam, prismatic, very hard, pH 6.1 to 6.5, 12 to 20 inches thick. (B2t)	Reddish-yellow sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C)	Well drained--	Moderately slow.	Rapid-----	None-------	High----------	60	9.0-11.0	Low-------	Range, wildlife, watershed.
OzE	Ojai-Zamora loams, 15 to 30 percent slopes:													
	Ojai loam part--	Moderately steep terraces.	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 26 inches thick. (A11)	Reddish-brown clay loam, prismatic, very hard, pH 6.1 to 6.5, 12 to 20 inches thick. (B2t)	Reddish-yellow sandy loam, massive, slightly hard, pH 6.1 to 6.5. (C)	Well drained--	Moderately slow.	Medium to rapid.	None-------	Moderate to high.	60	9.0-11.0	Low-------	Range, wildlife.
	Zamora loam part.	Moderately steep uplands.	Grayish brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Dark grayish-brown clay loam, blocky, hard, pH 6.6 to 7.3, 45 to 56 inches thick. (B2t)	Pale-brown loam, massive, hard, pH 7.9 to 8.4. (C)	Well drained--	Moderately slow.	Medium to rapid.	None-------	Moderate to high.	60	10.0-11.0	Moderate--	Range, wildlife.
OhF	Ojai loam, thin surface variant, 30 to 50 percent slopes.	Steep terraces--	Grayish brown, massive, hard, pH 6.1 to 6.5, 5 to 9 inches thick. (A12)	Brown clay loam, blocky, hard, pH 6.1 to 6.5, 18 to 30 inches thick. (B2t)	Yellowish-brown gravelly clay loam, massive, hard, pH 7.4 to 7.8, strongly calcareous. (C)	Well drained--	Moderately slow.	Rapid-----	None-------	High----------	60	8.0-10.0	Low-------	Range.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permeability	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
Po	Pond loam---------	Nearly level valley troughs.	Light brownish-gray, granular, slightly hard, pH 7.9 to 8.4, violently calcareous, 4 to 12 inches thick. (A1)	Light brownish-gray clay loam, blocky, hard, pH more than 9.0, violently calcareous, 15 to 22 inches thick. (B21t)	Light-gray silt loam, massive, hard, pH more than 9.0, strongly calcareous. (C1)	Moderately well drained.	Moderately slow.	Very slow.	None-------	Slight-------	60	9.0-11.0	Very low--	Limited range, wildlife, poultry farms, industrial sites.
Ps	Pond silty clay loam.	Nearly level valley troughs.	Light brownish-gray, massive, hard, pH 8.5 to 9.0, strongly calcareous, 8 to 10 inches thick. (A1)	Light brownish-gray clay loam, blocky, hard, pH more than 9.0, violently calcareous, 13 to 18 inches thick. (B21t)	Light-gray silt loam, massive, hard, pH more than 9.0, violently calcareous. (C1)	Moderately well drained.	Moderately slow.	Very slow to ponded.	None-------	Slight-------	60	9.5-11.5	Very low--	Range, wildlife.
Px	Pond-Oban complex:													
	Pond fine sandy loam part.	Nearly level valley trough basins (complex microrelief).	Pale brown, platy, slightly hard, pH 7.9 to 8.4, slightly calcareous, 4 to 12 inches thick. (A1)	Light brownish-gray silty clay loam, blocky, hard, pH 8.5 to 9.0, strongly calcareous, 15 to 22 inches thick. (B21t)	Light-gray silty clay loam, massive, very hard, pH 7.9 to 8.4, strongly calcareous. (C)	Moderately well drained.	Moderately slow.	Very slow.	Moderate---	Slight-------	60	8.5-10.5	Very low--	Range, wildlife.
	Pond silty clay loam part.	Nearly level valley trough basins (complex microrelief).	Light brownish gray massive, hard, pH 8.5 to 9.0, strongly calcareous, 8 to 10 inches thick. (A1)	Light brownish-gray clay loam, blocky, hard, pH more than 9.0, violently calcareous, 13 to 18 inches thick. (B21t)	Light-gray silt loam, massive, hard, pH more than 9.0, strongly calcareous. (C)	Moderately well drained.	Moderately slow.	Very slow.	None-------	Slight-------	60	9.5-11.5	Very low--	Range, wildlife.
	Oban fine sandy loam part.	Nearly level valley trough basins (complex microrelief).	Light yellowish brown, massive, slightly hard, pH 7.9 to 8.4, 4 to 12 inches thick. (A1)	Pale-brown heavy clay loam, columnar, very hard, pH more than 9.0, very strongly calcareous, 23 to 32 inches thick. (B21t)	Light olive-brown gravelly coarse sandy loam, massive, slightly hard, pH 8.5 to 9.0, violently calcareous. (C1ca)	Moderately well drained.	Slow------	Very slow.	Moderate---	None to slight.	60	7.5-9.0	Very low--	Range, wildlife.
RcA	Ramona coarse sandy loam, 0 to 2 percent slopes.	Nearly level terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 22 inches thick. (A1)	Brown sandy clay loam, blocky, hard, pH 6.6 to 7.3, 33 to 55 inches thick. (B2t)	Brown loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained--	Moderately slow.	Very slow.	Slight to moderate.	None to slight.	60	8.0-10.0	Moderate--	Small grains, alfalfa, range.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1]			Natural drainage class	Subsoil permeability	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
RcB	Ramona coarse sandy loam, 2 to 5 percent slopes.	Gently sloping terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 22 inches thick. (A1)	Brown sandy clay loam, blocky, hard, pH 6.6 to 7.3, 33 to 55 inches thick. (B2t)	Brown loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Slow------	Slight to moderate.	Slight------	60	8.0-10.0	Moderate---	Small grains, almonds, range, wildlife.
RcC	Ramona coarse sandy loam, 5 to 9 percent slopes.	Moderately sloping terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 22 inches thick. (A1)	Brown sandy clay loam, blocky, hard, pH 6.6 to 7.3, 33 to 55 inches thick. (B2t)	Brown loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Slow to medium.	Slight to moderate.	Slight to moderate.	60	8.0-10.0	Moderate---	Small grains, almonds, range, wildlife.
RcD	Ramona coarse sandy loam, 9 to 15 percent slopes.	Strongly sloping terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 22 inches thick. (A1)	Brown sandy clay loam, blocky, hard, pH 6.6 to 7.3, 33 to 55 inches thick. (B2t)	Brown loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Medium----	Slight to moderate.	Moderate----	60	8.0-10.0	Moderate---	Small grains, range.
RdE2	Ramona sandy loam, 9 to 30 percent slopes, eroded.	Strongly sloping to moderately steep dissected terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 15 inches thick. (A1)	Brown sandy clay loam, blocky, hard, pH 6.6 to 7.3, 25 to 40 inches thick. (B2t)	Brown loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Medium to rapid.	Slight-----	Moderate to high.	60	8.0-10.0	Moderate---	Range, wildlife, watershed.
ReC	Ramona gravelly sandy loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 15 inches thick. (A1)	Brown gravelly sandy clay loam, blocky, hard, pH 6.6 to 7.3, 16 to 24 inches thick. (B2t)	Brown gravelly loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Slow to medium.	Slight-----	Slight to moderate.	60	5.5-7.5	Moderate---	Range, wildlife, small grains.
ReE	Ramona gravelly sandy loam, 9 to 30 percent slopes.	Strongly sloping to moderately steep terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 15 inches thick. (A1)	Brown gravelly sandy clay loam, blocky, hard, pH 6.6 to 7.3, 16 to 24 inches thick. (B2t)	Brown gravelly loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Medium to rapid.	Slight------	Moderate to high.	60	5.5-7.5	Moderate---	Range, wildlife.
RfB	Ramona loam, 2 to 5 percent slopes.	Gently sloping terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 14 inches thick. (A1)	Brown light clay loam, blocky, hard, pH 6.6 to 7.3, 30 to 50 inches thick. (B2t)	Brown loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Slow------	None-------	Slight------	60	8.0-10.0	Moderate---	Small grains.
RfC	Ramona loam, 5 to 9 percent slopes.	Moderately sloping terraces.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 14 inches thick. (A1)	Brown light clay loam, blocky, hard, pH 6.6 to 7.3, 30 to 50 inches thick. (B2t)	Brown loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderately slow.	Slow to medium.	None-------	Slight to moderate.	60	8.0-10.0	Moderate---	Small grains, almonds, range, wildlife.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water	Inches	Inches		
Rg	Riverwash------------	Intermittent stream channels.	Variable sandy material, single grain, loose, pH 6.6 to 7.3, 6 to 12 inches thick.	Mixed sandy material, single grain, loose, pH 6.6 to 7.3, 28 to 34 inches thick.	Mixed sandy material, gravelly lenses, single grain, loose, pH 6.6 to 7.3.	Excessively drained.	Very rapid.	Very slow-	Slight to moderate.	Slight-------	60	1.0-3.0	Very low---	Watershed, wildlife.
RhF	Rock land------------	Strongly sloping to steep mountains and smaller hills.	-------------------	--------------------	----------------------	-------------	----------	Very rapid.	None-------	Slight-------	-----------	----------	-----------	Wildlife, watershed.
Rm	Rosamond loamy fine sand.	Nearly level alluvial fans.	Light brownish gray, massive, soft, pH 7.4 to 7.8, 10 to 16 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 14 to 30 inches thick. (C3)	Light brownish-gray loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	Moderate---	Slight-------	60	9.0-10.5	Moderate---	Alfalfa, pasture.
Rm2	Rosamond loamy fine sand, hummocky.	Nearly level alluvial fans.	Light brownish gray, massive, soft, pH 7.4 to 7.8, 12 to 36 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 14 to 28 inches thick. (C3)	Light brownish-gray loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	High-------	Slight-------	60	9.0-10.0	Moderate---	Spring range.
Ro	Rosamond fine sandy loam.	Nearly level alluvial fans.	Light brownish gray, platy, slightly hard, pH 7.4 to 7.8, 8 to 18 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 21 to 33 inches thick. (C3)	Light brownish-gray loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	Slight to moderate.	Slight-------	60	9.5-11.0	Moderate---	Irrigated crops, range, wildlife.
Rp	Rosamond loam--------	Nearly level alluvial fans.	Light brownish gray, massive, hard, pH 7.4 to 7.8, 6 to 8 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 32 to 34 inches thick. (C3)	Light brownish-gray loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	None-------	Slight-------	60	10.0-11.5	Moderate---	Irrigated crops, wildlife, range.
Rr	Rosamond loam, saline-alkali.	Nearly level alluvial fans.	Light brownish gray, massive, hard, pH 8.5 to 9.0, 10 to 12 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 8.5 to 9.0, strongly calcareous, 18 to 36 inches thick. (C3)	Light brownish-gray loam, massive, hard, pH 8.5 to 9.0, violently calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	None-------	Slight-------	60	10.0-11.5	Low--------	Spring range.

See footnotes at end of table.

SUMMARY OF SOIL CHARACTERISTICS AND QUALITIES, ANTELOPE VALLEY AREA, CALIFORNIA--Continued

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permeability	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
Rs	Rosamond loam, sandy loam substratum.	Nearly level alluvial fans.	Light brownish gray, platy, slightly hard, pH 7.4 to 7.8, 8 to 12 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 32 to 36 inches thick. (C3)	Light brownish-gray sandy loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	None-------	Slight-------	60	7.5-8.5	Moderate---	Alfalfa, pasture, irrigated crops, range.
Rt	Rosamond silty clay loam.	Nearly level alluvial fans.	Pale brown, platy, slightly hard, pH 7.4 to 7.8, 4 to 12 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 7.9 to 8.4, strongly calcareous, 18 to 36 inches thick. (C3)	Light brownish-gray loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	None-------	Slight-------	60	11.0-12.0	Moderate---	Alfalfa, pasture, irrigated crops, range.
Ru	Rosamond silty clay loam, saline-alkali.	Nearly level alluvial fans.	Pale brown, massive, hard, pH 8.5 to 9.0, 10 to 12 inches thick. (C1)	Pale-brown light silty clay loam, blocky, hard, pH 8.5 to 9.0, strongly calcareous, 28 to 30 inches thick. (C3)	Light brownish-gray loam, massive, hard, pH 8.5 to 9.0, violently calcareous. (C5)	Moderately well drained.	Moderate--	Very slow-	None-------	Slight-------	60	11.0-12.0	Low--------	Spring range.
RzF	Rough broken land---	Moderately steep to steep mountainous uplands.	Variable sandy loam, loam, silty clay loam that includes some pebbles and cobbles, variable thickness.	Variable loam and silty clay loam (lacking in many places), variable thickness.	Shale, sandstone, conglomerate, granitic sediment, variable hardness.	Excessively drained.	Variable--	Very rapid.	Slight-----	Very high----	Variable---	----------	Very low---	Wildlife, watershed.
Sa	Sandy alluvial land--	Recent flood plains.	Variable sandy material, very fine platy, slightly hard, pH 6.6 to 7.3, 6 to 12 inches thick.	Mixed sandy material, massive, slightly hard, pH 6.6 to 7.3, 28 to 34 inches thick.	Mixed sandy material, massive, slightly hard, pH 6.6 to 7.3.	Excessively drained.	Very rapid.	Very slow-	Moderate---	Slight-------	60	3.0-5.0	Very low---	Range, wildlife, watershed.
ScE	Saugus loam, 15 to 30 percent slopes.	Moderately steep uplands.	Grayish brown, blocky, hard, pH 6.6 to 7.3, 12 to 20 inches thick. (A1)	Grayish-brown loam, blocky, hard, pH 6.1 to 6.5, 22 to 36 inches thick. (C2)	Weakly consolidated sediment. (C3)	Well drained-	Moderate--	Medium----	None-------	Moderate-----	34-56	5.0-7.5	Low--------	Range, homesites.
ScF	Saugus loam, 30 to 50 percent slopes.	Steep uplands-----	Grayish brown, blocky, hard, pH 6.6 to 7.3, 12 to 20 inches thick. (A1)	Grayish-brown loam, blocky, hard, pH 6.1 to 6.5, 22 to 36 inches thick. (C2)	Weakly consolidated sediment. (C3)	Well drained-	Moderate--	Rapid-----	None-------	High---------	34-56	5.0-7.5	Low--------	Range, homesites.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
ScF2	Saugus loam, 30 to 50 percent slopes, eroded.	Steep uplands-----	Grayish brown, blocky, hard, pH 6.6 to 7.3, 8 to 17 inches thick. (A1)	Grayish-brown loam, blocky, hard, pH 6.1 to 6.5, 26 to 39 inches thick. (C2)	Weakly consolidated sediment. (C3)	Well drained-	Moderate--	Rapid-----	None--------	High---------	34-56	5.0-7.5	Low-------	Range, wildlife, watershed.
ShE	Sheridan sandy loam, 15 to 30 percent slopes.	Moderately steep upland foothills.	Gray, crumb, soft, pH 6.1 to 6.5, 20 to 26 inches thick. (A11)	Brown gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 0 to 12 inches thick. (C)	Hard, broken and shattered granitic rock. (R)	Well drained-	Moderately rapid.	Medium---	Slight------	Moderate-----	24-36	3.5-5.0	Moderate--	Range, wildlife.
ShE2	Sheridan sandy loam, 15 to 30 percent slopes, eroded.	Moderately steep upland foothills.	Gray, crumb, soft, pH 6.1 to 6.5, 20 to 26 inches thick. (A11)	Brown gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 0 to 12 inches thick. (C)	Hard, broken and shattered granitic rock. (R)	Well drained-	Moderately rapid.	Medium---	Slight------	Moderate-----	24-36	3.5-5.0	Moderate--	Range, wildlife.
ShF	Sheridan sandy loam, 30 to 50 percent slopes.	Steep mountainous uplands.	Gray, crumb, soft, pH 6.1 to 6.5, 20 to 26 inches thick. (A11)	Brown gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 0 to 12 inches thick. (C)	Hard, broken and shattered granitic rock. (R)	Well drained-	Moderately rapid.	Rapid----	Slight------	High---------	24-36	3.5-5.0	Moderate--	Range, wildlife, watershed.
ShF2	Sheridan sandy loam, 30 to 50 percent slopes, eroded.	Steep mountainous uplands.	Gray, crumb, soft, pH 6.1 to 6.5, 20 to 22 inches thick. (A11)	Brown gravelly sandy loam, massive, slightly hard, pH 6.1 to 6.5, 0 to 16 inches thick. (C)	Hard, broken and shattered granitic rock. (R)	Well drained-	Moderately rapid.	Rapid----	Slight------	High---------	24-30	2.5-3.5	Moderate--	Range, wildlife, watershed.
SoB	Soboba cobbly loamy sand, 2 to 5 percent slopes.	Gently sloping alluvial fans.	Pale brown, massive, slightly hard, pH 6.6 to 7.3, 3 to 6 inches thick. (C1)	Pale-brown very cobbly loamy coarse sand, single grain, loose, pH 6.6 to 7.3, 18 to 22 inches thick. (C2)	Light brownish-gray very cobbly loamy coarse sand, single grain, loose, pH 7.4 to 7.8, slightly calcareous. (C3)	Excessively drained.	Very rapid.	Very slow-	Slight to moderate.	Slight-------	60	2.0-3.0	Very low--	Range, wildlife, recreation.
SsA	Sorrento loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Brown, blocky, hard, pH 7.4 to 7.8, 7 to 14 inches thick. (Ap)	Brown loam, massive, hard, pH 7.9 to 8.4, 7 to 9 inches thick. (B2)	Yellowish-brown loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C1)	Well drained-	Moderate--	Very slow-	None--------	Slight-------	60	8.5-10.0	High------	Irrigated crops.
SsB	Sorrento loam, 2 to 5 percent slopes.	Gently sloping alluvial fans.	Brown, blocky, hard, pH 7.4 to 7.8, 7 to 14 inches thick. (Ap)	Brown loam, massive, hard, pH 7.9 to 8.4, 7 to 9 inches thick. (B2)	Yellowish-brown loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C1)	Well drained-	Moderate--	Slow-----	None-------	Slight-------	60	8.5-10.0	High------	Irrigated crops.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1/]			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water				
											Inches	Inches		
Su	Sunrise loamy fine sand.	Nearly level basin rim.	Light yellowish brown, massive, soft, pH 7.9 to 8.4, strongly calcareous, 12 to 19 inches thick. (A11)	Pale-yellow heavy loam, massive, hard, pH 8.5 to 9.0, violently calcareous, 12 to 20 inches thick. (C1)	White loam, massive, weakly cemented, pH 8.5 to 9.0, violently calcareous. (C2ca)	Moderately well drained.	Moderately slow.	Very slow-	Moderate---	Slight-------	24-39	3.5-5.0	Low--------	Alfalfa, wildlife, range.
Sv	Sunrise sandy loam---	Nearly level basin rim.	Very pale brown, massive, soft, pH 7.9 to 8.4, strongly calcareous, 6 to 20 inches thick. (A11)	Pale-yellow heavy loam, massive, hard, pH 8.5 to 9.0, violently calcareous, 12 to 20 inches thick. (C1)	White loam, massive, weakly cemented, pH 8.5 to 9.0, violently calcareous. (C2ca)	Moderately well drained.	Moderately slow.	Very slow-	Moderate---	Slight-------	24-39	4.0-5.5	Low--------	Irrigated crops, wildlife, range.
Sw	Sunrise sandy loam, shallow.	Nearly level basin rim.	Very pale brown, massive, soft, pH 7.9 to 8.4, strongly calcareous, 2 to 4 inches thick. (A1)	Pale-yellow heavy loam, massive, hard, pH 8.5 to 9.0, violently calcareous, 8 to 11 inches thick. (C1)	White loam, massive, weakly cemented, pH 8.5 to 9.0, violently calcareous. (C2ca)	Moderately well drained.	Moderately slow.	Very slow-	Moderate---	Slight-------	10-15	2.0-3.0	Low--------	Irrigated pasture, range, poultry ranches.
Sx	Sunrise loam---------	Nearly level basin rim.	Very pale brown, massive, slightly hard, pH 7.9 to 8.4, strongly calcareous, 6 to 16 inches thick. (A11)	Pale-yellow heavy loam, massive, hard, pH 8.5 to 9.0, violently calcareous, 18 to 24 inches thick. (C1)	White loam, massive, weakly cemented, pH 8.5 to 9.0, violently calcareous. (C2ca)	Moderately well drained.	Moderately slow.	Slow------	None-------	Slight-------	24-39	4.5-6.0	Low--------	Alfalfa, wildlife, range.
Sy	Sunrise loam, saline-alkali.	Nearly level basin rim.	Light brownish gray, massive, slightly hard, pH 8.5 to 9.0, strongly calcareous, 8 to 16 inches thick. (A11)	Pale-yellow heavy loam, massive, hard, pH 8.5 to 9.0, violently calcareous, 16 to 24 inches thick. (C1)	White loam, massive, weakly cemented, pH 8.5 to 9.0, violently calcareous. (C2ca)	Moderately well drained.	Moderately slow.	Slow------	None-------	Slight-------	24-39	4.0-6.0	Low--------	Range.
TrF	Temescal-Rock land complex, 30 to 50 percent slopes:													
	Temescal sandy loam part-------	Steep uplands------	Light brownish gray, blocky, slightly hard, pH 6.1 to 6.5, 4 to 5 inches thick. (A1)	Light brownish-gray heavy sandy loam, massive, slightly hard, pH 6.1 to 6.5, 10 to 15 inches thick. (B2)	Slightly weathered andesite. (R1)	Well drained--	Moderate---	Rapid-----	Slight-----	High---------	14-20	2.0-3.0	Low--------	Range, wildlife, watershed.
	Rock land part----	Steep uplands------	-------------------	---------------------	-----------------------	------------	----------	Very rapid.	None-------	Slight-------	-----------	-----------	-----------	Wildlife, watershed.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile [1/]			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water	Inches	Inches		
TsF	Terrace escarpments--	Moderately steep to steep terrace breaks.	Brown loam and sandy loam, massive, hard, pH 6.1 to 7.3, variable in thickness.	Generally reddish-brown clay loam, blocky, hard, pH 6.1 to 6.5, varia-ble thickness.	Variable sandy material, massive, slightly hard, pH 7.4 to 7.9.	Well drained--	Moderately slow.	Medium to rapid.	Slight------	Moderate to high.	60	6.0-9.0	Low--------	Wildlife, range.
Tt2	Tray fine sand, hummocky.	Nearly level basin rim (complex micro relief).	Light brownish gray, single grain, loose, pH 7.4 to 7.8, 18 to 36 inches. (A1)	Yellowish-brown heavy sandy loam, massive, hard, pH more than 9.0, strongly calcar-eous, 22 to 30 inches thick. (B2t)	Light yellowish-brown coarse sandy loam, massive, hard, pH more than 9.0, very strongly calcareous. (C1)	Moderately well drained.	Moderate--	Very slow-	High--------	None to slight.	60	4.5-5.5	Low--------	Range.
Tu	Tray sandy loam------	Nearly level basin rim.	Light yellowish brown, massive, slightly hard, pH 7.4 to 7.8, slightly calcar-eous, 7 to 10 in-ches thick. (A1)	Yellowish-brown heavy sandy loam, massive, hard, pH 7.9 to 8.4, strongly calcar-eous, 12 to 16 inches thick. (B2t)	Light yellowish-brown coarse sandy loam, massive, hard, pH 7.9 to 8.4, strongly calcareous. (C1)	Moderately well drained.	Moderate--	Very slow-	Moderate----	None to slight.	60	5.5-6.5	Moderate---	Alfalfa.
Tv	Tray sandy loam, saline-alkali.	Nearly level basin rim.	Light yellowish brown, massive, slightly hard, pH more than 9.0, slightly calcar-eous, 6 to 16 inches thick. (A1)	Yellowish-brown heavy sandy loam, massive, hard, pH more than 9.0, strongly calcar-eous, 22 to 30 inches thick. (B2t)	Light yellowish-brown coarse sandy loam, massive, hard, pH more than 9.0, strongly calcareous. (C1)	Moderately well drained.	Moderate--	Very slow-	Slight to moderate.	None to slight.	60	5.5-6.5	Low--------	Range, wildlife.
Tw	Tray loam, saline-alkali.	Nearly level basin rim.	Pale brown, massive, slightly hard, pH more than 9.0, slightly calcar-eous, 6 to 12 inches thick. (A1)	Yellowish-brown heavy sandy loam, massive, hard, pH more than 9.0, strongly calcar-eous, 12 to 16 inches thick. (B2t)	Light yellowish-brown coarse sandy loam, massive, hard, pH more than 9.0, strongly calcareous. (C1)	Moderately well drained.	Moderate--	Very slow-	Slight-----	Slight-------	60	6.0-7.0	Low--------	Range.
VaA	Vernalis sandy loam, 0 to 2 percent slopes.	Nearly level allu-vial fans.	Pale brown, blocky, hard, pH 7.4 to 7.8, 8 to 12 in-ches thick. (Ap)	Pale-brown loam, massive, hard, pH 7.9 to 8.4, 20 to 24 inches thick. (B2)	Pale-brown loam, mas-sive, slightly hard, pH 7.9 to 8.4, very slightly calcareous. (C1)	Well drained--	Moderate--	Very slow-	Slight-----	None to slight.	60	8.5-9.5	Moderate---	Small grains, irrigated crops, range.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/			Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard		Effective rooting depth	Available water capacity	Inherent fertility	Present land use
			Surface layer	Subsoil	Substratum or parent material				Wind	Water	Inches	Inches		
VbA	Vernalis loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Light brownish gray, blocky, hard, pH 7.4 to 7.8, 8 to 16 inches thick. (Ap)	Pale-brown loam, massive, hard, pH 7.9 to 8.4, 20 to 24 inches thick. (B2)	Pale-brown loam, massive, slightly hard, pH 7.9 to 8.4, very slightly calcareous. (C1)	Well drained--	Moderate--	Very slow-	None--------	None to slight.	60	9.0-10.0	Moderate---	Small grains, irrigated crops, range.
VbB	Vernalis loam, 2 to 5 percent slopes.	Gently sloping alluvial fans.	Light brownish gray, blocky, hard, pH 7.4 to 7.8, 8 to 16 inches thick. (Ap)	Pale-brown loam, massive, hard, pH 7.9 to 8.4, 20 to 24 inches thick. (B2)	Pale-brown loam, massive, slightly hard, pH 7.9 to 8.4, very slightly calcareous. (C1)	Well drained--	Moderate--	Slow------	None--------	Slight-------	60	9.0-10.0	Moderate---	Small grains, irrigated crops, range.
VcA	Vernalis clay loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Pale brown, massive, hard, pH 7.4 to 7.8, 8 to 12 inches thick. (Ap)	Pale-brown loam, massive, hard, pH 7.9 to 8.4, 20 to 24 inches thick. (B2)	Pale-brown loam, massive, slightly hard, pH 7.9 to 8.4, very slightly calcareous. (C1)	Well drained--	Moderate--	Very slow-	None--------	None to slight.	60	9.5-10.5	Moderate---	Sugar beets, small grains, range.
VsD2	Vista coarse sandy loam, 9 to 15 percent slopes, eroded.	Strongly sloping foothills.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 18 inches thick. (A1)	Brown sandy loam, massive, hard, pH 6.6 to 7.3, 16 to 20 inches thick. (B2)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Medium----	Slight------	Moderate-----	28-38	2.5-3.5	Low--------	Small grains, range, wildlife.
VsE	Vista coarse sandy loam, 15 to 30 percent slopes.	Moderately steep uplands.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 18 inches thick. (A1)	Brown sandy loam, massive, hard, pH 6.6 to 7.3, 16 to 20 inches thick. (B2)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Medium to rapid.	Slight------	Moderate to high.	28-38	2.5-3.5	Low--------	Range, wildlife, watershed.
VsE2	Vista coarse sandy loam, 15 to 30 percent slopes, eroded.	Moderately steep uplands.	Brown, massive, hard, pH 6.1 to 6.5, 12 to 14 inches thick. (A1)	Brown sandy loam, massive, hard, pH 6.6 to 7.3, 16 to 24 inches thick. (B2)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Medium to rapid.	Slight------	Moderate to high.	28-38	2.5-3.5	Low--------	Range, wildlife, watershed.
VsF	Vista coarse sandy loam, 30 to 50 percent slopes.	Steep uplands-----	Brown, massive, hard, pH 6.1 to 6.5, 12 to 18 inches thick. (A1)	Brown sandy loam, massive, hard, pH 6.6 to 7.3, 16 to 20 inches thick. (B2)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Rapid-----	Slight------	High----------	28-38	2.5-3.5	Low--------	Range, wildlife, watershed.
VsF2	Vista coarse sandy loam, 30 to 50 percent slopes, eroded.	Steep uplands-----	Brown, massive, hard, pH 6.1 to 6.5, 12 to 14 inches thick. (A1)	Brown sandy loam, massive, hard, pH 6.6 to 7.3, 16 to 24 inches thick. (B2)	Hard granitic rock. (R)	Well drained--	Moderately rapid.	Rapid-----	Slight------	High----------	28-38	2.5-3.5	Low--------	Range, wildlife, watershed.

See footnotes at end of table.

Map symbol	Soil name	Position	Soil profile 1/ Surface layer	Soil profile 1/ Subsoil	Soil profile 1/ Substratum or parent material	Natural drainage class	Subsoil permea-bility	Runoff	Erosion hazard Wind	Erosion hazard Water	Effective rooting depth	Available water capacity	Inherent fertility	Present land use
											Inches	Inches		
WgC	Wyman gravelly loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans and terraces.	Brown, massive, hard, pH 6.6 to 7.3, 8 to 14 inches thick. (A12)	Reddish-brown gravelly clay loam, blocky, hard, pH 6.6 to 7.3, 38 to 50 inches thick. (B2t)	Brown gravelly sandy loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderate--	Slow to medium.	None-------	Slight to moderate.	60	8.5-9.5	Moderate---	Small grains, range, wildlife.
WgD	Wyman gravelly loam, 9 to 15 percent slopes.	Strongly sloping alluvial fans and terraces.	Brown, massive, hard, pH 6.6 to 7.3, 8 to 14 inches thick. (A12)	Reddish-brown gravelly clay loam, blocky, hard, pH 6.6 to 7.3, 38 to 50 inches thick. (B2t)	Brown gravelly sandy loam, massive, slightly hard, pH 6.6 to 7.3. (C)	Well drained-	Moderate--	Medium----	None-------	Moderate----	60	8.5-9.5	Moderate---	Small grains, range, wildlife.
WoC	Wyman cobbly loam, 5 to 9 percent slopes.	Moderately sloping alluvial fans and terraces.	Brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Reddish-brown gravelly clay loam, blocky, hard, some cobblestones, pH 6.6 to 7.3, 16 to 20 inches thick. (B2t)	Brown gravelly sandy loam, massive, slightly hard, some cobblestones, pH 6.6 to 7.3. (C)	Well drained-	Moderate--	Slow to medium.	None-------	Slight to moderate.	60	5.5-7.0	Low--------	Range, wildlife.
YoA	Yolo loam, 0 to 2 percent slopes.	Nearly level alluvial fans.	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 20 inches thick. (A1)	Grayish-brown loam, massive, hard, pH 6.8 to 7.3, 12 to 18 inches thick. (B2)	Light yellowish-brown loam, massive, hard, pH 6.8 to 7.3. (C)	Well drained-	Moderate--	Very slow-	None-------	None to slight.	60	8.5-10.5	High-------	Irrigated crops.
YoC	Yolo loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping alluvial fans.	Grayish brown, massive, hard, pH 6.1 to 6.5, 16 to 20 inches thick. (A1)	Grayish-brown loam, massive, hard, pH 6.8 to 7.3, 12 to 18 inches thick. (B2)	Light yellowish-brown loam, massive, hard, pH 6.8 to 7.3. (C)	Well drained-	Moderate--	Slow to medium.	None-------	Slight to moderate.	60	8.5-10.5	High-------	Irrigated crops, homesites, range.
ZaC	Zamora loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping terraces.	Grayish brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Dark grayish-brown clay loam, blocky, hard, pH 6.6 to 7.3, 45 to 56 inches thick. (B2t)	Pale-brown loam, massive, hard, pH 7.9 to 8.4. (C)	Well drained-	Moderately slow.	Slow to medium.	None-------	Slight to moderate.	60	10.0-11.0	Moderate---	Range, small grains, wildlife.
ZaD	Zamora loam, 9 to 15 percent slopes.	Strongly sloping terraces.	Grayish brown, massive, hard, pH 6.1 to 6.5, 8 to 14 inches thick. (A1)	Dark grayish-brown clay loam, blocky, hard, pH 6.6 to 7.3, 45 to 56 inches thick. (B2t)	Pale-brown loam, massive, hard, pH 7.9 to 8.4. (C)	Well drained-	Moderately slow.	Medium----	None-------	Moderate-----	60	10.0-11.0	Moderate---	Range.
ZcC	Zamora clay loam, 2 to 9 percent slopes.	Gently sloping to moderately sloping terraces.	Grayish brown, massive, hard, pH 6.1 to 6.5, 8 to 10 inches thick. (A1)	Dark grayish-brown clay loam, blocky, hard, pH 6.6 to 7.3, 45 to 56 inches thick. (B2t)	Pale-brown loam, massive, hard, pH 7.9 to 8.4. (C)	Well drained-	Moderately slow.	Slow to medium.	None-------	Slight to moderate.	60	10.5-11.5	Moderate---	Range.

1/ Description is for dry soil; and except for thickness of surface layer and subsoil, it is for the horizon shown in parentheses, for example, (B21t), as described in the text.

2/ Not described in text; lacking in places.

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